TECHNOLOGY DEPT.

TECHNOLOGY

June 1958

approach

THE NAVAL AVIATION SAFETY REVIEW

NAVAER 00-75-510

PUBLIC LIBRARY
MAY 29 1958
DETROIT

PUBLIC LIBRARY
JUN 2 - 1958
DETROIT

HOT WEATHER ISSUE

LETTERS

Vol. 3

No. 12

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U.S. Naval Aviation Safety Center.

Varicam for Trim

Sir:

. . . to the letters of CDR Matton (Nov 57) and Mr. K. E. Dentel (Mar 58) APPROACH, I would like to add:

The varicam on the P2V series aircraft is a horizontal trim device and not a horizontal control device, and if P2V pilots will keep this in mind, they will never get into trouble when a surprise waveoff presents itself. By trimming subject aircraft in the final approach at normal approach speeds through the use of the varicam and then landing the aircraft with the yoke, waveoffs are a "piece of cake." The danger exists in using the varicam to assist the landing flare and then taking a waveoff. Trim 'em with the varicam, but land 'em with the yoke!!

Pilots can get into trouble with slab tails (F3H for instance) by trimming for the flare and then taking a waveoff, just as in the P2V, so it isn't a problem peculiar to the trusty *Neptune*.

J. G. CARL, LCDR
Eng. Officer, BAR St. Louis

Jury Rig

Sir:

. . . I have observed the nylon straps for the S2F wings which you illustrated in APPROACH (March, page 42).

Preceding the advent of the straps we had experienced several fatigue failures of the nipple on the fuselage to which the jury-strut attached. When this occurred in high winds, the strut was free to punch holes in the aircraft skin. With the strut removed the wing would oscillate about 10-15 degrees placing dynamic loads on the wing-fold system but never lifting above 15 degrees.

Installation of the nylon straps did not help correct these problems. It was impossible to maintain, or even obtain, sufficient tension in the long straps to prevent additional failures of the nipples. Once the strut was broken loose the strap was still ineffective in preventing the oscillation of the wing.

My primary objection to the straps is that their creation and use represent no more than stop-gap maintenance. What is really needed is a better jury-strut. Any efforts that do not result in prevent-

approach

Published by U.S. Naval Aviation Safety Center — NAS Norfolk 11, Va.
Phone Norfolk, MAdison 2-8211, extension 4331
RADM Allen Smith, Jr.
Commander, Naval Aviation Safety Center
CDR F. C. Moyers,
Head, Literature Department

Editor: A. B. Young, Jr.; **Managing Editor:** LCDR W. J. Thomas; **Art Director:** R. A. Genders; **Associate Editors:** CDR J. A. Scholes, J. T. LeBarron, JOC, J. C. Kiriluk; **Illustrator:** R. B. Trotter; **Production:** C. A. Coe, JO3

Purposes and Policies: This periodical contains the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders, or directives unless so stated. Material extracted from Aircraft Accident Reports, (OpNav 3750-1), Aircraft FLIGA Report (3750-10), and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Names used in accident stories are fictitious unless stated otherwise. Photos: Official Navy or as otherwise credited.

To assure use of the latest available information, Non-naval activities are requested to contact NASC prior to reprinting APPROACH material.

Correspondence: Contributions are welcome as are comments and criticisms. Address correspondence to U. S. Naval Aviation Safety Center, NAS Norfolk 11, Va. No payment can be made for manuscripts submitted for publication. The Editor reserves the right to make any editorial changes in manuscripts which he believes will improve the material without altering the intended meaning. Views expressed in guest written articles are not necessarily those of the Naval Aviation Safety Center.

Printing: Printing of this publication approved by the Director of the Bureau of the Budget, 31 Dec. 1957.

Subscriptions: Published monthly, this magazine may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Single copy 30 cents; 1 year subscription $3.25; 75 cents additional for foreign mailing.

Library of Congress Catalog No. 57-60020.

ing additional failures of the strut are certainly not worthy of your support as the leader in professional aviation safety.

LT (JG)

Good Show

Sir:

A section of APPROACH is reserved for names of men preventing wheels-up landings through personal diligence and alertness. Why not a section devoted to the alertness and attentiveness to duty of the men who prevent "locked-control" takeoff?

During VA-104's recent deployment, such an incident occurred when a transport, loaded with pared for takeoff. Emerson F. Snyder, AM2, a member of VA-104 noticed the aileron battens still attached to the aircraft. The aircraft was warming up for takeoff and Snyder immediately notified the flight orderly who in turn signaled to the pilot that the aileron battens were still in place. Had the aircraft become airborne in this condition, the crew, plus personnel from VA-104 would have met with a certain catastrophe.

For this man's definite alertness to duty and for his familiarity with proper safety factors involved in the preflighting of aircraft, it is felt that Snyder is deserving of special recognition at this time.

R. G. COLEMAN, LCDR

Threshold Lights

Dear Sir:

As requested . . . we circulated the article "Runway Shorthand" in the February APPROACH and have just received comments.

. . . the illustration on page 11, for U.S. Standard (A) approach lighting is incorrect: The threshold lights should be green and the wing bars red. Your illustration does not indicate the color of the first and shows the second as green. I think I recognize the illustration, it was one made by the Coast and Geodetic Survey and has been picked up by a number of publications (including one of our own). Unfortunately, in the original drawing, the colors of the lights were incorrectly indicated. Your explanation in the text, however, is all right.

Page 10 (end of second column) . . . "thus at civil fields the threshold lights may appear to be outside the runway lights indicating there is a usable overrun; if inside, there is no overrun . . ." This is misleading information since there are many exceptions to this . . . .

E. JAFFE, Chief
Aeronautical Reference Division
CAA

Re: Click-Click

Sir:

This is in answer to an "Anymouse" report titled "Click-Click" in the March APPROACH. I wonder how many people, pilots, towers, and reporting points were blocked while this guy went merrily clicking on his way. I would like to bring to light a few "RULES".

1. When two-way radio fails, proceed according to latest clearance when IFR. If VFR, *land*!

2. I have never, never heard of, nor have I seen in print, any system of communication using the clicking of a mike.

3. Code (Morse) is no longer a requirement for air controlman and doubtless very few pilots ever use it. This is probably the guy who hollers when the frequencies are crowded with excess transmissions, but it's alright to click-click for 25 minutes.

N. O. MORSE

'Grounds' for Complaint

I was amused by CDR Colkitt's letter . . . (March) . . . principally because it appeared that he, like many, many (oh, so many) other people seems to think that none of us "younguns" have to worry about maintaining our proficiency.

October 31 was a sort of Red-letter day in my life because at that point I was graduated into the Navigation phase of training at Hutch. It has developed into sort of a Black-Letter day because I have not since touched the controls (indeed, ever been in the cockpit while in flight) of any aircraft of any description whatsoever. Whatever proficiency I may have begun to develop in the training command has all but evaporated, I'm sure. And it's hardly the squadron's fault when they have nearly 60 aviators assigned where 30 would be perfectly adequate. If CDR Colkitt does'nt want his *Beech* possibly he could send it (together with 6 months' supply of gas) to:

COFFEE MAKER
c/o VP squadrons, Any NAS

IN THIS ISSUE

Letters	1
Meatball And Paddles	4
Hot As A Pistol	10
Monitor	14
Anymouse	16
Headmouse	22
Wheels Saves	23
Whiz Quiz	23
Truth and Consequences	24
Exit Report	30
Do You Dress The Part?	33
A Salty Yarn	34
Notes from Your Flight Surgeon	37
A Plug for Plugs	38
From the Ground Up	40
Murphy's Law	47
Tip Tank	48
Old Pro	IBC

Photo credits: Photo. B, Page 7, Chance Vought Aircraft Co.; Page 11, Douglas Aircraft Co.; Page 12, Chance Vought Aircraft Co.; Page 13, Photo A, Chance Vought Aircraft Co.; Photo B, McDonnell Aircraft Co.

'Codes'

Sir:

You asked for some suggestions on page 31 of the October APPROACH. Here are a couple of ideas:

1. How about pointing out the difference between confidence and over-confidence? A razor's edge separates the two. Yet think of all the accidents that are caused by over-confidence—at least 50 percent I would say. Confidence is the greatest thing in the world, but over-confidence is deadly in connection with airplanes. Overconfidence occurs mostly in young aviators. It is a by-product of virility. You could point out the importance of knowing thyself and of con-

Continued from preceding page

tinuously evaluating one's capabilities and limitations.

2. When a pilot shows up at the squadron or readyroom with a fresh cold, he should be sent home or to the BOQ if ashore, or to his room if afloat. He should be told to get to bed and stay there for a day or two. This should be SOP.

If this procedure is followed, the cold germs won't be sprayed all over the squadron area, and the person with the cold will recover much sooner.

B. D. STASER, LCDR, USN
NROTC Unit, Dartmouth College
Hanover, New Hampshire

Re para. 1—a feature is coming up soon on this. Re para. 2, the medics concur in cutting down spreading of germs, but advise that diagnosis of cold and action is definitely flight surgeon prerogative!—Ed.

Wants M-B Seat, Now

Sir:

A few days ago I read an article in the local newspaper which went something like this: "Navy pilot killed when plane lost power in landing approach . . . . the pilot remained with the plane long enough to guide it clear of houses then ejected but was at an altitude of about 500 feet and his parachute did not open. He is survived by . . . ." This is when it suddenly struck me how strange it was for Navy (or Air Force) like ours with the finest aircraft and the best pilots in the world to still be using a means of escape from an aircraft which dates back to the F8F.

Not too long ago I saw an article in your magazine which clearly illustrated a seat which is capable of saving a man's life at ground level. Now I would like to have someone explain to me what kind of politics are necessary to keep that seat out of every "Bunsen Burner" we have in the fleet today. It can't possibly be a lack of money because any amount spent would be worth saving just one or two lives. I don't claim to be an expert on jet aviation, but I have been driving the Navy's airplanes long enough to know that at some point in his career a pilot can expect an engine failure of some sort.

Now the big chance is: will it happen over water so I can ditch? will I have enough altitude to bail-out safely? I am sure these thoughts go thru a pilot's mind every time he climbs into his bird. It seems that just in terms of efficiency increased by a pilot's increased confidence to know that he can part company with his steed even on the takeoff run would be enough reason to swallow our pride and admit that the "Limeys" have come up with a better seat and do our damndest to incorporate it into the planes we have in the Navy (and Air Force) now, right now and not for the ones on the drawing board.

The fact that jet trainer is using this Martin-Baker seat doesn't satisfy me in the least nor does the old adage "It's on order, but these things take time!"

These things do not take time if they are pushed by the right people, and it is more than inexcusable if they are not on order. I think this would be a very worthy crusade for APPROACH. I don't think I would be too far off base to say that these are the sentiments of most pilots. If I am, then I humbly retract everything I said and go on my foggy way and hope that I never have a flameout below the prescribed minimum of 1000 feet.

WHEN I GOTTA GO

Martin Baker and rocket catapult seats are scheduled for early incorporation in all aircraft with ejection seats. Schedule is not available at this time.—Ed.

Idle H.P. Un-idle

Sir:

Just read a report of another pilot aborted a jet takeoff, but not quite getting stopped while still up on the runway. This happens often and from several situations; aborted takeoffs; fast landings on wet runways; long landings; heavy weight landings, etc. We can make a big dent in these incidents if we will just think about it.

Take any figure that you can find for idle thrust of your engine with about 100 knots of wind down the intake (early phases of landing rollout) and multiply that by 100 knots in feet/second. Convert this answer from foot-pounds-per-second to Horsepower and see what kind of a truck you are driving at this point. Now take a typical landing weight and visualize yourself driving this 10,000-to-20,000-pound truck with 120 to 200 horsepower, wide open, down the highway. It seems to me that if you must stop in a hurry you want to get rid of that horsepower before you run out of highway.

The situations for your airplane, weather, field traffic and so on may vary some of the cases. But you ought to talk it over and see what this offers you, and what the difficulties are, in your squadron's pattern of operations.

I have used it, in several different airplanes, and squadrons, and it does work. I find that I am less embarrassed to be towed back to the line because I stop-cocked the engine than to walk back because the airplane is deep in the mud.

R. F. (Greymouse) HUNT
CDR, USN

P. S. You can stop an A4D-1 in 2700 ft. in a dead calm, if you turn it off right after touchdown.

BuAer Wheels Action

Sir:

I have been following the letters regarding "Wheels-Up Accident Prevention" in the past few issues of APPROACH with a great deal of interest. I have expected with every issue that an article would be published explaining what has been done along this same line.

Since nothing has been forthcoming, I feel that somebody should step forward and inform the readers what action has been taken by the much maligned Bureau of Aeronautics.

1. Sometime back (years) a project was set up at the Naval Air Test Center, Patuxent River to evaluate a number of devices to prevent wheels-up landings. An evaluation of this sort is not particularly easy as it is very difficult for an aviator to condition himself to deliberately forget to put his landing gear DOWN.

2. The following system, however, was recommended:

a. A red light flashing at the rate of 60 to 120 flashes per minute illuminating the word "WHEELS" located on the upper left-hand pilot's instrument panel.

b. The light was to flash whenever all of the following conditions existed:

(1) Landing gear was not fully EXTENDED and LOCKED.

(2) Flaps in any position except at full UP.

(3) Throttle reduced below normal cruise power settings.

c. This requirement was made effective for future produc-

tion aircraft of the single-piloted and trainer variety early in 1956 and some aircraft were to be retrofit. A complete list of aircraft affected escapes my memory at the present time. A partial list of aircraft approved for this installation is as follows:

T28-B/C	All
T2V-1	All
T2J	All
F9F-8	Later series
F9F-8T	All
AD	Some series
TT-1	All
T34 (modified version)	All

The actual selection of aircraft for this installation of the wheels warning system depended a great deal on factors such as utilization, expected life of type, status of contract, availability of funds, duplication of already existing warning systems (such as are now installed in SNB and TV-2), and many other factors that are too numerous and varied to be listed here.

A little publicity about this system will probably do a lot of good. Recently I went to fly one of two newly acquired F9F-8s at a local Fasron. The pilot who had just returned with the aircraft was busy writing up a long discrepancy about a red light that started flashing when he throttled back and dropped his flaps preparatory to commencing slow airwork at altitude.

Upon explaining to this pilot that this was the way it was supposed to work, he erased his discrepancy with the remark "How the H ..... do you know?"

His remark had merit since the latest revision to Flight Handbook available at that time did not mention this change.

INTERESTED

Bless the Blissful

Sir:

. . . believe there are some Navy pilots who still think they're flying back in the 20's . . . seems a few of them have never heard of *positive* control . . . probably these very same few who never look at an Operations Manual even when departing a field other than their home station.

If they had, the pilots of three N3N's who departed this seadrome, would have known that this station is under positive control at all times and surely would not have taken off on Sealane 34 without a light signal from the tower at the same time that the tower had an emergency straight-in to Sealane 11. Had they looked up at the control tower, they would have seen the General Warning and red lights that were being flashed at them. After they were airborne they were too busy buzzing the seadrome to notice that they were still being given the General Warning Light.

All I can say is, it's a good thing that the tower had radio contact with the P5Ms, or the Navy would own less P5Ms or N3Ns than they do today.

All aircraft without a radio, please wait 'til you get that green light from the tower before takeoff. I don't want to have to hit that crash phone for your aircraft.

SEAPLANE TOWER OPERATOR

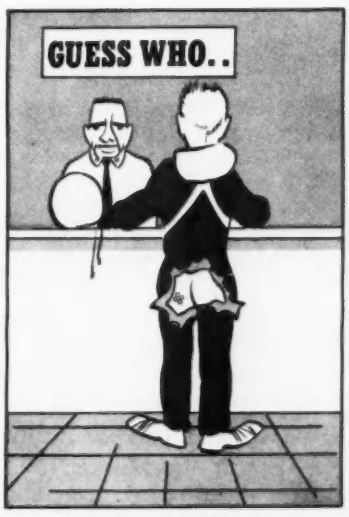
RE: Murphy's Law

Sir:

. . . Page 47 of March 1958 APPROACH. Backward my foot. If that's not an engineering bust in production I'll eat it. Try reversing the upper clamp shown on the left-hand photo. The correct way shown on the right photo clearly shows the two little dog ears on the left edge of both clamps. Even though that fat finger almost hides this similarity.

Printing the title on this page in reverse is cute. Too cute. You've got a good thing going for you in Murphy's Law—don't louse it up.

CONFUSED



. . . had a wheels-up landing.

1 YR AGO THIS ISSUE

BRAKING, June 57, page 26
WEATHER, June 57, page 5
SHIPBOARD 'COPTER OPS, June 57, page 31
FIRST UNDERWATER EJECTION, June 57, page 20

2 YRS AGO THIS ISSUE

OMNI, June 56, page 10
CRASH & FIREFIGHTING, June 56, page 32
CRASH INVESTIGATION, June 56, page 4
HIGH SPEED EJECTION, June 56, page 26

Many APPROACH *articles are as valid in accident prevention today as when they were originally published. Reprints or extra copies of the issues mentioned here are available by request from NASC, if not in your Aviation Safety Officer's or Flight Surgeon's file.*

Costs Up

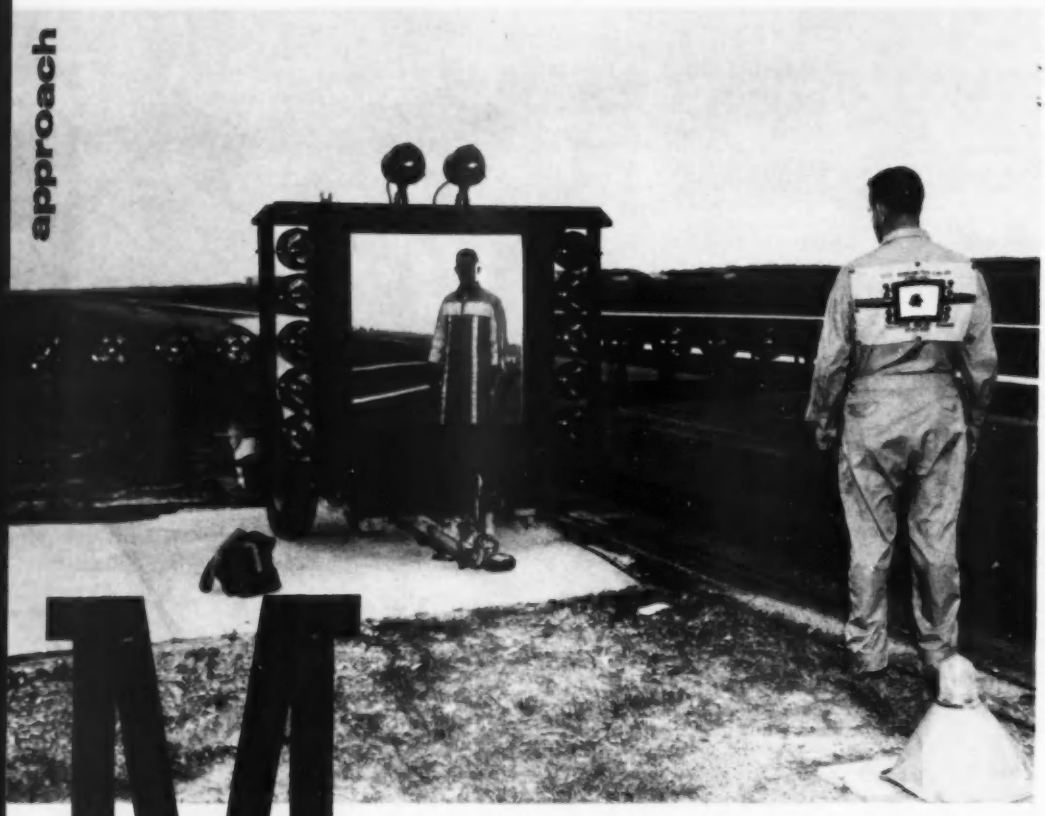
SAFETY's costing a bit more too—the Government Printing Office advises us that effective immediately APPROACH subscription prices are going up as follows:

Old Rate

$2.50 a year domestic
.75 additional for foreign mailing
.30 single copy

New Rate

$3.25 a year domestic
.75 additional for foreign mailing
.30 single copy



MEATBALL

THE QUESTION OF METHOD AND TECHNIQUE IN THE ACCOMPLISHMENT OF A SAFE CARRIER LANDING HAS BEEN THE SUBJECT OF INTENSE INTEREST AND SPECULATION THROUGHOUT THE EXISTENCE OF CARRIER AVIATION. WITH THE ADVENT OF THE MIRROR LANDING SYSTEM SOME OF THE OLD PROBLEMS WERE ALTERED OR ELIMINATED, AND NEW PROBLEMS HAVE ARISEN. THIS ARTICLE IS A COMPILATION OF EXTRACTS FROM REPLIES TO NASC'S REQUEST FOR COMMENT FROM FLEET UNITS ON THE HIGHLY VITAL SUBJECT OF MEATBALL & PADDLES. . . .

Statement of the Problem

BY CAG 12, 11 OCTOBER 1957: "A CARRIER APPROACH TO AND LANDING ON THE ANGLED DECK UNDER STABLE DECK CONDITIONS IS NOT MUCH MORE DIFFICULT TO EXECUTE THAN A NORMAL LANDING. THE METHOD OF APPROACH SELECTED UNDER SUCH CONDITIONS IS NOT TOO CRITICAL, ALTHOUGH THE MLS HAS ADVANTAGES AT NIGHT. THE TECHNIQUE OF FLYING THE 'MEATBALL' IS ACQUIRED EASILY, BUT

REQUIRES ESSENTIALLY THE SAME FUNDAMENTAL KNOWLEDGE OF AIRPLANE PERFORMANCE CHARACTERISTICS AND DEGREE OF PRACTICE AS DOES ANY METHOD OF CARRIER APPROACH EMPLOYED.

"THE IMPORTANT POINT IS THAT NEITHER TIME NOR OPPORTUNITY PERMIT TRAINING AND RETAINING DESIRABLE PROFICIENCY IN MORE THAN ONE METHOD WHILE ABOARD SHIP; YET, WHEN SEA OR SUN CONDITIONS EXIST WHICH TAX OR EXCEED THE CAPABILITY OF THE MLS TO PROVIDE USEABLE INFORMATION, AN ALTERNATE METHOD BECOMES MANDATORY. THE TIMES THAT IT BECOMES NECESSARY TO REVERT TO PADDLES APPROACHES MAY BE FEW, BUT ARE USUALLY ASSOCIATED WITH THE MOST CRUCIAL LANDING PROBLEM. THAT IS THE ORIGIN OF MAJOR CONCERN."

FLEET COMMENTS

CAG 1, 9 Dec 1957: "It is the opinion of this command that it is impossible to maintain the LSO and pilot proficiency necessary to allow the use of the flat approach under adverse deck conditions.

"The present solution appears to be the curtailment of flying when rough seas are encountered in order to compensate for the increased number of wave-offs and bolters to be expected."

CAG 202, 12 Nov 1957: "To fully restore the teamwork between the LSO and pilot, the LSO must be able to determine aircraft speed, glide slope position, hook to ramp clearance, and a means of transmitting required corrections to the pilot.

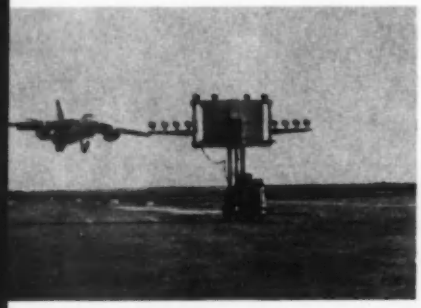
"During extreme pitching deck conditions, when airspeed indicator difficulties occur in the aircraft, or when the MLS is inoperative, pilots should be instructed to fly a flat paddles approach."

CAG 17, 12 Dec 1957: "Pilots are kept 'up to snuff' by requiring at least two FCLP (mirror) periods per pilot per month after initial field qualification. Pilots are also required to qualify in the mirror type approach (mirror out) on paddles. In this procedure (considered standby — not emergency) the pattern remains the same except that the paddles rather than the mirror supply glide path information. The LSO gives 'highs', 'low', 'slants', speed signals (infrequently), and 'low dips' (occasionally with swept-wing aircraft) — keeping his mouth tightly shut except in an emergency or with an obviously 'shook' pilot.

"The group has qualified day and night using an unstabilized mirror which pooped out periodically. In all cases the shift to paddles (still making the mirror type approach) was routine and qualifications continued.

"If a pilot can't seem to hack the mirror when the deck is pitching, put him on paddles but don't take away the descending approach. To

Continued next page



" . . . the important point is that neither time nor opportunity permit training and retaining desirable proficiency in more than one method while aboard ship. . . . "

shift a pilot, already in difficulty, to an entirely different type of approach is asking him to help in arranging his own funeral. The old hands can safely shift but the old hands usually aren't the ones that get in trouble."

CATG 1, 17 Oct 1957: "Since a thorough knowledge of aircraft slow flight characteristics is mandatory, and since aviators must learn the precision adjustments necessary in carrier aviation, this Group uses 'paddles' approaches on Day FCLP until each pilot demonstrates the required proficiency and control, i.e., is considered Day Field-Qualified. Then mirror approaches are commenced, occasionally preceded by two paddles approaches for refresher purposes. When considered Day Mirror-Qualified, either type of approach may be scheduled and flown with a slight emphasis on mirror approaches.

"Night FCLP is conducted in a similar manner; however, the number of night 'paddles' periods is reduced in proportion to the total number. Familiarization with a mirror (descending) approach using the lighted LSO night suit as glide path indication (a 'Roger' meaning 'on glide path') is given.

"During the last deployment, carrier landings were conducted using 'paddle' approaches for initial touch-and-go landings and initial day qualification landings, and then mirror approaches for subsequent touch-and-go landings and build-up landings. All night carrier work was done on the

" . . . night FCLP is conducted in a similar manner. . . . all night carrier work was done on the mirror on the last cruise . . . "

mirror on the last cruise. Occasionally, an 'all paddles' day was scheduled during the deployment. Fortunately, the mirror system was operative during all night carrier operations, but if the mirror **had** failed, a mirror type approach with the lighted night suit as guide, and radio information, would have been used to effect recovery.

"With severe roll, deck heave, rapid and heavy pitch, and ship 'wallow', the mirror often becomes without value. This command feels that under such adverse deck conditions, where deck motion may cause unsafe impact loads and extreme pilot difficulty, paddles passes may be better used than mirror passes, so that the LSO can have full positive control over the approach."

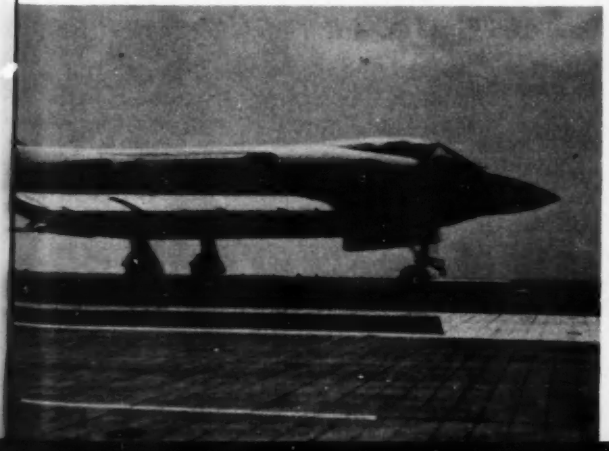
CAG 6, 9 Oct 1957: "This Air Group has been embarked in the USS INTREPID (CVA-11) for a period of six months with a record of over 4000 mirror-type landings and only one aircraft damaged ('B') in the landing phase. The INTREPID is the *first ship to utilize the permanent port installation* of the Mark I, Mod 0, gyro stabilized landing mirror system. The system has operated with 100 percent operational availability over the six months period. It has been observed under extreme weather conditions such as low ceiling and visibility (less than 300 feet and one mile in rain and fog), high seas (waves 15 feet and higher) and high winds (over 50 knots).

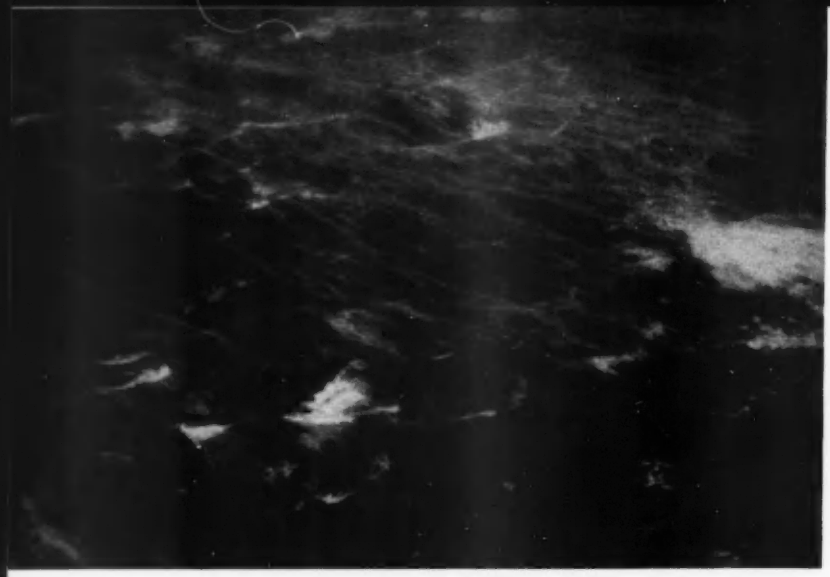
"In these extreme conditions, modified mirror approaches with the paddles as well as approaches on the mirror have been made for evaluation purposes. The LSOs involved were considered experienced and well trained.

"It has been determined as a result of these informal tests, that the mirror itself used in conjunction with the LSO radio instructions are decidedly superior even in the most extreme and hazardous conditions.

"To take as an example the most extreme case, a badly pitching and rolling deck (green water or heavy spray over the hurricane bow) and high gusty winds, utilization of the mirror was feasible in every instance where the following procedure was employed. The pilot was initially informed of the deck's condition and instructed to set up a pattern that provided a groove somewhat longer than normal. This longer groove

". . . maintaining this rate of descent and avoiding the urge to 'follow-the-deck' are especially important as the aircraft closes the ship."





". . . the mirror has been observed under extreme weather conditions such as . . . one mile in rain . . . high sea states . . . and high winds."

provided the pilot with a better opportunity to set up a constant meatball, i.e., steady rate of descent, as the meatball appears relatively steady to the pilot at 1¼-mile from the ramp when compared to its steadiness close in.

"Maintaining this rate of descent and avoiding the urge to 'follow-the-deck' are especially important as the aircraft closed the ship. As the aircraft approaches within 300-400 yards of the ship, the meatball will be jumping badly due to the lag in the stabilization unit of the mirror and the proximity of the closing aircraft. However, if the pilot has retained his initial rate of descent and is not 'following-the-deck', it is possible to average out the meatball motion for small corrections. He must at this time pay close attention to the LSO radio instructions for these instructions provide exact last minute instructions that the gyrating meatball cannot do at the ramp. The pilot is thusly set up to effect a safe landing."

COMNAVAIRPAC INST. 3740.2E — ALL CARRIER AIR GROUP SQUADRONS AND DETACHMENTS WILL CONDUCT FCLP UTILIZING BOTH LSO AND MIRROR CONTROLS AND QUALIFICATIONS WILL BE ATTAINED BY BOTH METHODS PRIOR TO COMMENCING DAY QUALIFICATIONS ABOARD SHIP. NIGHT FCLP QUALIFICATIONS FOR ALL UNITS ASSIGNED ANGLED DECK CARRIERS SHALL BE OBTAINED UNDER LSO AND MIRROR CONTROLS. REGARDLESS OF METHOD OF CONTROL, ALL CARRIER AND FCLP APPROACHES WILL BE MIRROR TYPE FOR ALL AIRCRAFT ASSIGNED TO ANGLED DECK CARRIERS.

COMNAVAIRLANT INST. 3740.12A — SQUADRONS TRAINING FOR QUALIFICATIONS ON ANGLED DECK CARRIERS CONDUCT FCLP UTILIZING MIRROR PATTERN WITH BOTH MIRROR AND LSO CONTROL. - - - LSO CONTROL IS AN APPROACH FLOWN UTILIZING THE MIRROR PATTERN WITH THE LSO CONTROLLING THE APPROACH BY RADIO AND/OR PADDLES. - - - THE MIRROR APPROACH PATTERN WILL BE UTILIZED AT ALL TIMES ON ANGLED DECK CARRIERS WITH EITHER MIRROR OR LSO CONTROL. PRIOR TO NIGHT QUALIFICATION EACH PILOT SHALL HAVE COMPLETED A MINIMUM OF TWO LSO CONTROLLED MIRROR TYPE APPROACHES.

Future

Appreciating this problem and continuing in the search for improved methods and techniques to make the carrier landings safer, the Bureau of Aeronautics has established the following project to be conducted by the Naval Air Test Center, Patuxent River.

Abstract of Project: "Conduct FCLP and arrested landing tests both landbased and shipboard without the aid of the mirror. Recommend pilot techniques for entering glide slope, and for glide slope control including flight through stackwash and ship turbulence to touchdown. Recommend the extent of LSO participation and methods of his communication with the pilot. Include any special techniques which might apply for approaches for barricade engagements or other emergency conditions.

Purpose: "The purpose of this project is to establish the best method for making a constant glide slope carrier approach and landing without the aid of an optical glide path indicator. The results will then be used as a source of guidance for fleet operators in conducting flight operations when the mirror or lens systems cannot be used.

"An additional purpose of these tests will be to recommend a revised definition of the Landing Signal Officer's position with relation to all carrier landing operations now that the mirror has come into fleet-wide use."

The results of these tests will be described in *Approach* as soon as possible.

". . . recommend a revised definition of the Landing Signal Officer's responsibilities with relation to all carrier landing operations . . ."

"RARELY DOES A NEW DEVICE OR TECHNIQUE LEND ITSELF TO IMMEDIATE AND COMPLETE INTEGRATION IN THE SYSTEM FOR WHICH IT IS DESIGNED, AND THE MIRROR IS NO EXCEPTION. . . . THE PITCHING DECK SITUATION AUTOMATICALLY REQUIRES THE USE OF THE LSO TO: (A) ATTEMPT TO MONITOR A SIMULATED MIRROR GLIDE PATH APPROACH — IN WHICH THE LSO ATTEMPTS TO DETECT THE SPEED AND ALTITUDE CHANGES, OR (B) HAVE THE PILOT REVERT TO A FLAT PASS IN THE CONVENTIONAL LSO MANNER.

(NAVY LSOS FEEL THAT IN SUCH SITUATIONS, AS WHEN THE MIRROR BECOMES INOPERATIVE, PILOTS SHOULD NOT GO BACK TO THE RELATIVE UNFAMILIARTY OF THE FLAT LSO PASS, BUT ATTEMPT A MIRROR-TYPE APPROACH WITH MONITORING ASSIST FROM THE LSO.)"

—From special Mirror Issue, April '57 APPROACH

. . . THERE'S NOTHING
NEW IN AVIATION
SAFETY
— INCLUDING THE
SLOGAN "THERE'S
NOTHING NEW IN
AVIATION SAFETY."
. . . AND SO IT IS
WITH HOT
WEATHER FLYING — THE
FACTS ABOUT
TEMPERATURE,
PRESSURE,
AND DENSITY HAVE
BEEN AROUND
A LONG TIME
. . . HERE ARE THE SAME
OLD FACTS THAT
KILLED
PEOPLE WHO DIDN'T
HEED
THEM LAST YEAR.
THINK ABOUT
'EM — AND
DO SOMETHING
ABOUT 'EM
BEFORE
YOU TAKE OFF ON A
DAY THAT'S

HOT AS A P

PISTOL

"HOT as a pistol" — maybe that's you, but we're not talking about people now. We mean a hot day, the kind of day when mama says, "Don't come home for lunch. I'm taking the kids to the beach," and you wonder why you ever got a convertible for a second car—that seat will be Hot As A Pistol when you climb in at go-home time.

You're already wet under the arms by the time morning quarters are over. The readyroom is hot—not Hot As A Pistol yet, but it will be by the time your mid-morning briefing comes around. The G-suit is hot, and the boondockers aren't ventilated either, but squadron SOP says nix on oxfords, they're for dancing, inspections and beer busts.

Here comes the dope — who, where, when and how, and it's pretty hot out there today men, so we're going light on the gas load and check your ground roll figures with each other to be sure you're not out in left field. Can't go damaging that government sagebrush out at the end of the runway.

Well, what's it all about? Hot day, you roll farther before you lift off, right? So you sweat it a li'l longer than on a cold day, c'mon, let's kick the tire and light the fire, time's a'wastin'.

Hold everything, Junior (not you, sir), let's sit down in this hot readyroom with some hot coffee and do a bit more sweating here on the deck before you perspire the full length of the runway right into the tuleys.

HOW MUCH longer is your ground roll? HOW MUCH thrust have you lost because it's Hot As A Pistol today? Pretty hard to measure it in sweat, but if you don't know in real, meaningful numbers you're an amateur aviator in a professional aviator's billet. You know, there's some point where the ambient temperature is so great that you'll NEVER get off, you'll just taxi east or west until your hat floats. And there's some point, on a nice cold winter day, when it's cold enough so you'll get off like a scared jackrabbit. Well, today — and most every day, you're somewhere in between. But where?

There's no gradual transition you know, the runway just suddenly pays out and becomes prairie, or duck pond, or wire mesh fence, just like that. If you're on the WIN side, even by one foot, you're off and running. But if you're still churning along on the pavement when it quits, you suddenly become a very expensive bulldozer. Whether you fly off or roll off the runway is largely up to *you*.

Hot weather flight operations are predicated on a point of departure known as a standard day. There aren't very many of them drifting around, so don't hold your breath looking for one—it's

Continued from preceding page

just a basis for determining how unstandard today is.

On a standard day at sea level the average temperature is 59° F (15° C), and this decreases at the rate of 3.56° F (2° C) per thousand feet altitude. The air pressure at sea level on a standard day is 29.92" (14.7 psi), and the air density is 0.077 pounds per cubic foot, average. These are interesting numbers, but more than interesting they are the basis for determining how long you'll roll (and sweat) before you lift off. What do these numbers mean to you?

Any time your ambient inlet temperatures is greater than 59° F, you have lost some thrust. How much thrust? Well, generally for each 10° F rise in temp. above standard, you lost about 4%. Not 4% of rated thrust now, for rated thrust is obtained only on a test stand. You've lost some of the rated thrust just by installing the engine in an airplane. At 100° F. you'll get only 86.9% of the thrust that you had on a 59° day, and when the runway temp. at inlet level gets up to 120°, which it often does on summer days, you're only getting 81.6% thrust at 100% RPM.

What does this mean to you in useful terms? It means you'll accelerate slower, you'll rumble farther down the strip before the bird will fly. How much farther? Again, your handbook for each model will tell you exactly; generally you'll find your takeoff run is increased about 10% for each 10° F rise in ambient inlet temp.

So far we've talked thrust only —what about good, old-fashioned, *prop*-driven horsepower?

The pro tiger does more than kick the tire and light the fire!

A recip loses takeoff horsepower as the ambient temp. rises too, for it mixes fuel and air by weight, not by volume. And on a hot day the air weighs less, it has less density than the 0.077 lbs/cu. ft. it had on a standard day.

Now, let's consider both props and jets. Whichever you're driving, you've got less oomph available to scoot you along. How about lift? Lift depends upon density of the air. In hot (less dense) air, you need more TAS to lift off, even though your IAS will remain about the same. The thrust you need to reach that TAS has already been diminished, and what's left is not all available to accelerate—some of it is consumed just to keep you moving at *no* acceleration, to keep you from DEcelerating. So you roll and roll, and your wings claw at the hot, thin air, and comes the Big Temptation to lift her nose up toward where she wants to go —or rather, where *you* want her to go—she isn't quite ready. Bring her nose up too early and you're in real trouble, hot day or cold. But it's on the hot day that you make a sticky situation stickier by bringing her up because you think she's overdue—it's just against human nature to keep her rolling when all winter long you've been off and cleaning up right about this point. Just like tromping on that nonexistent clutch for several weeks after you get that new Hydra-

matic-equipped convertible.

Air density will vary with elevation as well as temperature, so any time you shove off from an NAS considerably above sea level you're already imposed with an increased takeoff roll, even on a cool day. Remember the old slogan—"high, hot and humid"? They can be had in any combination, but the worst is when you have all three. So you've got to allow for a 10% increase in ground roll for each 1000 feet of elevation, and a 2-3% loss in thrust. Now do you see why Muroc Dry Lake bed comes in handy? Tony LeVier of Lockheed tells of a time when he used up 15,000 feet of it getting off, and his margin of excess thrust after becoming airborne was near to being measured in ounces!

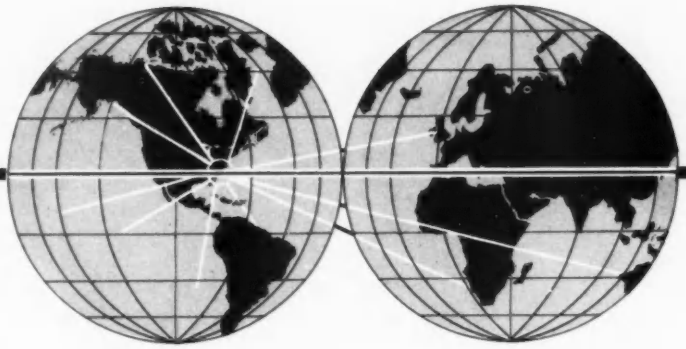
To the "high, hot and humid" trio we could also add "heavy", for your gross weight is one thing you can control to a limited degree. Dick Wenzell talked about heavy takeoffs last month; did you get to read it?

Well now, what's to do when it's cold-beer drinking weather and you're scheduled to go up where it's plenty cool? Like we said, there's nothing new in aviation safety, and if you've been punching the ground run table for each takeoff there's nothing new for you to do. But if you've been kicking the tire, lighting the fire, and trusting in your Will To Fly to get you off that Hot As A Pistol runway—DON'T.

Things to remember this summer while mama's at the beach:

- Ground roll distances are MINIMUM distances *needed* for takeoff—you may need just a smidgeon more than the minimum.
- The temp on a sequence is not the temp above the runway at the inlet height of your aircraft; the difference can be small, but big enough to run you out of NAS.
- Thrust loss from high ambient temperatures is 4 to 5 times greater for jets than for props.
- Your fuel is less dense too—less pounds per gallon.
- You can stretch your luck, but you can't stretch the runway. ●

MONITOR



High Speed/High Rate Descents:—

Recent near misses between military jets and civil transports re-emphasize collision hazards existing during high speed/high rate descents by jet aircraft under VFR conditions. Instructions and operating procedures must be reviewed frequently and pilots cautioned to *avoid such descents on airways* and into congested terminal areas unless military mission or emergency so demands. High speed/high rate descent is defined as one which involves either speeds or rates of descent in excess of those recommended for IFR penetration by the type aircraft involved. In addition to the above, ground radar facilities, off airways letdowns and clearing turns must be utilized whenever possible. A well informed alert pilot using all facilities and abilities available continues to be our best means of averting mid-air collisions. CNO

Foreign Object Preventive

MAG 11 is barricading certain vehicular accesses to their taxiways. This is being done mainly to prevent refueler trucks from depositing mud on taxiways after returning from the fuel storage area. This should aid in keeping taxiways cleaner.—*Atsugi Consolidated.*

Fire-Proofing Flight Clothing

An ASO commented on BuAer ACSEB 38-57 and suggested some provision for fire proofing flight clothing be made locally.

It was suggested the station laundry use a deep vat for this purpose. The ability of the laundry to accomplish fire-proofing of flight clothing mentioned above is being investigated. — *ComFairJap/ComNABs.*

Rain Covers

An A3D incident involved the elevator control freezing at 36,000 feet. All elevator movement was lost and the pilot elected to return to base. A penetration was commenced and at 19,000 feet the yoke suddenly pulled out of his hands. He recovered the yoke and regained control and at 7,000 feet complete elevator control was again available. Investigation indicated that the rain water got into the tail during the previous night while it was folded and when the aircraft reached the higher altitude the controls froze. Rain covers over the tail while folded are to be used in the future.—*Whidbey Area. (ASC 215, which allows the tail to remain vertical with the wings folded is expected to be available this month.—Ed.)*

EXCERPTS FROM SOME OF THE NAVY'S SAFETY COUNCILS THROUGHOUT THE WORLD, WHO PROVIDE LOCAL LEADERSHIP AND EMPHASIS TO THE NAVAL AVIATION SAFETY PROGRAM.

Jet Parking

Where feasible park jets nose to nose instead of nose to tail. This will provide greater safety for refueling personnel from jet blast and prevent dust and dirt from being blown up into the jet intakes.—*NAS Atsugi*

Precision on Final

After a visit to the GCA trailer, pilots are convinced of making the small corrections when given. Prior to reaching final it is not too important for a pilot to be precise about his heading and altitude but once on final he must be precise. For a normal GCA it requires a pilot to really be sharp for about 3-4 minutes. This is not much time or too much to ask even if he is tired after completing a long flight.—*Consolidated Sub-Area/NAS Brunswick, Me.*

Put it in Writing

The commanding officer has the authority to require certain things to be done. One of these that is very prominent is to establish standard operating procedures. These standard operating procedures should be placed in writing to prevent them from degenerating as they pass through various stages of inexperience.

The commanding officer should demand thorough procedures and never tolerate incomplete, careless or haphazard performance.—*Consolidated Sub-Area/ NAS Brunswick, Me.*

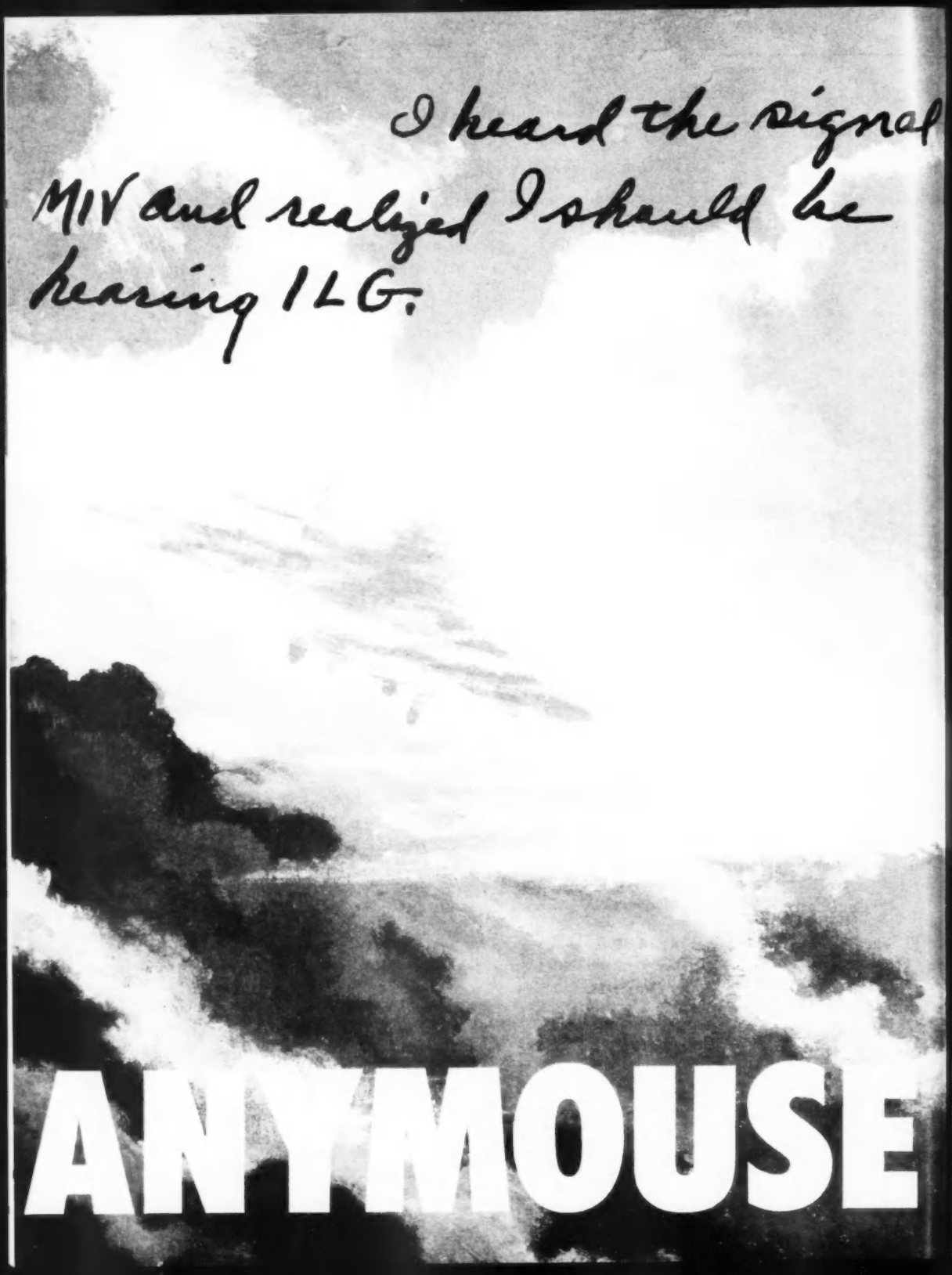
Night Turn-up Without Light

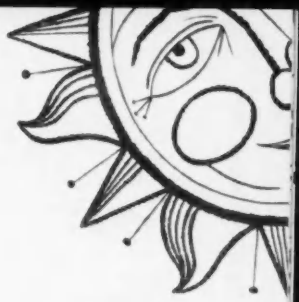
Cases have been reported where pilots have turned up aircraft at night without lights being on. It was recommended that the aviation safety officer and the assistant flight training officers review this unsafe practice with all pilots and that the aircraft maintenance department do the same with all maintenance and squadron enlisted personnel.—*NARTU Norfolk.*

Steady as you Go

In the past it has been witnessed that crash vehicles are over-eager proceding to accident scenes. Drivers start out like "wild indians," sometimes in wrong direction, then receive different instructions by radio and execute rapid and sudden turns with terrific swaying and leaning of heavy equipment. Caution Operations Department to instruct crash vehicle drivers to proceed expeditiously, but not recklessly. Overturned fire trucks on the runway will not help remove pilots from a burning plane.—*CNABaTra*

I heard the signal
MIV and realized I should be
hearing ILG.





8:30 CURTAIN

I HAD left New York on a Monday night to ferry an F9F-6 back from Alameda and it was now Friday evening. I had arrangements with an important prospective customer to see a new Broadway stage show on Friday. The tickets had been purchased weeks in advance and I knew the date, if successful, would go a long way toward getting this large account's business.

I had landed at Columbus Friday afternoon in CAVU weather and soon learned that the New York area was closing in fast with foggy, humid, air mass weather. Between the time I first read the sequence reports and the time I completed my VFR flight plan an hour later, the ceiling and visibility had lowered to just above GCA minimums. As this moment "get homitis" over-powered "better judgment", and I refiled to Mitchell Field IFR.

Mitchell was selected for three reasons: it was outside the high density metropolitan New York area; I was familiar with the penetration pattern; and it was close to my home. Since Atlantic City had 1800′ and 4 miles visibility, I chose it as my alternate. Estimated time en route was 54 minutes and I had 2 hours and 10 minutes' fuel aboard.

It was 1730 by the time I got out to the flight line and I felt that with some luck I would still be able to keep our date for the show, but wouldn't make it in time for dinner. ATC cleared me to Red Bank, New Jersey, to remain VFR on top at 30,000′ and to contact New York Center when I got there.

While approaching Red Bank on schedule, I could hear the incessant chatter which indicated New York was completely socked in and heard traffic stacked over Idlewild, La Guardia and Newark up to 15,000′. At this point, I debated whether I should make the 180-degree turn that was called for and decided against it. When ATC told me over Red Bank that both Mitchell and Atlantic City were now below GCA minimums, I again considered returning to one of the bases along my route from Columbus. However, ATC advised that both New Castle and Dover Air Force Bases were open so I decided to try for New Castle. I reasoned that with 45 to 60 minutes' fuel left it would be no strain and smarter than flying west for 20 minutes to a field where the weather might also be closed in. So I contacted New Castle and obtained their weather—1800′ and 2½ miles—and clearance to commence penetration.

While I was letting down outbound New Castle Approach Control asked if I wanted GCA to pick me up out of my inbound turn. My answer was a hearty affirmative, so they gave me the frequency which I immediately set up to facilitate the transfer when I completed my turn. Everything looked rosy until I passed through 1500′ in the turn, and discovered I was still in the soup. At 1000′, inbound I still could not see the ground and so advised New Castle with the additional comment that I was switching to GCA.

Radio contact with GCA was established immediately, but I became apprehensive when they advised they did not have me on their scope. As I was checking my altimeter at 800′, GCA asked if I was VFR yet. When I said negative, they advised me to switch to tower frequency as they were in a training status and could not work a plane on actual instruments! By this time, my ADF indicated I had passed over the station and I pulled up into the missed approach turn. I knew then that I was in

AND HIS HAIRY TALES

Continued from preceding page

trouble and could not understand why the tower insisted there was a 1200′ ceiling over the field when at 500′ I couldn't even see my wingtips! About this time, the fuel warning light came on indicating I was down to 1000 lbs. After setting up maximum endurance flight and rechecking the approach chart and Rad Fac, I suddenly heard the signals MIV in my ears and realized I should be hearing ILG! I had tuned in Milville radio on 365 KC, instead of New Castle on 350 KC!

By the time I had rechecked the frequencies, retuned my receiver, oriented myself and headed for New Castle, I was down to 700 lbs. Ten minutes later, just about the time I was preparing myself for another ejection (had one on Wednesday while flying an acceptance check in an F9 that never got there), I suddenly broke into the clear over New Castle. The ceiling was 900′ and a big bubble of clear air about two miles across squatted over the field. The tower operator who had talked me through most of the ordeal cleared me for an immediate landing. The fuel gauge read 400 lbs. at the completion of my roll out.

The elapsed time for this 54 minute flight which never should have left the ground was one hour and 58 minutes, plus about 5 lbs. of sweat and a year of my life.

Having escaped a fatal accident once, I foolishly stuck my neck out ten miles to the point where sheer carelessness almost accomplished what ignorance failed to do. I learned the hard way that you can never get so smart or so bold that a single mistake won't kill you.

COLD AGAIN

"ON AN IFR climbout in an A4D-2 the cockpit temperature went to full cold and could not be controlled. I broke out on top at 35M and immediately my omni went out and my Tacan went out. It was cold in the cockpit but I decided I could stand it. Since we were VFR on top, I decided to fly wing on my wingman.

"After 45 minutes at 39M my fingers were numb and my feet started to feel numb. After about 1 + 10 my canopy frosted over. I then called Norfolk Center and told them I was deviating from my flight plan and proceeding directly to NAAS Edenton. They cleared me and I then contacted Edenton Radar.

"My wingman had joined on me, since I could not see him, and we made a radar letdown with GCA picking us up on final. My windscreen was still frosted over and I could barely see out of the side but I managed to touchdown alright. On rollout my brakes didn't work at first and just about as I was ready to engage the arresting gear my brakes took hold.

"My hands and feet were still numb and I was shivering badly and I couldn't sign the yellow sheet when I went into the line shack. I had worn flight gloves, issue high cut boots, G-suit, summer flight suit and integrated harness. I noticed that the more uncomfortable I felt, the more the tendency was to get the flight over and get on the deck. I started rushing myself and forgetting the basic flight rules.

"However, as soon as Edenton radar identified me on their scope I relaxed since I had worked with them before. The next time if a similar situation happened, I would finish my climbout then call approach control for a letdown and landing."

Your experience may save another pilot's life. Send in an ANYMOUSE report.

WOULDN'T UNFEATHER

"PRIOR to takeoff on a single-engine indoctrination flight in an S2F a feathering and unfeathering check was made as per squadron doctrine. The check proved satisfactory and takeoff and climb to 6000 feet was made without incident.

"After instructing the student in single-engine procedure, the starboard prop was feathered, engine secured, and the plane trimmed. Practice turns were made and ten minutes later several attempts were made to unfeather. The prop would not unfeather so an uneventful single-engine landing was made.

"Upon returning to the line a mechanic who was flying in the plane as aircrew said that after the feather button was pushed in it did not pop out again for some time. A check of the starboard oil tank proved it to be empty but the engine itself was filled with oil.

"The prop governor was removed and sent to O&R where it was found that the pressure release solenoid (set for 650 psi) did not release until 850 psi was applied. This caused the feathering pump to run overtime and pump all the oil from the tank into the engine, leaving no oil for the unfeathering operation.

"Although a feathering and unfeathering check prior to takeoff is an excellent practice, it does not preclude in-flight failure. If I had watched the feather button to see that it popped out, or had checked the ammeter for a current drop, which occurs when the feather motor stops, I could have manually stopped the motor on time and thus prevented a single engine landing.

"I recommended that whenever a single-engine occurs, or is given intentionally, the pilot or copilot watch the feather button and appropriate ammeter to determine that the feather motor cuts out at the required time; and if it doesn't, to pull out the feather button manually to the neutral position."

RESOLUTION TIME

"ON a cross country flight from Cherry Point to Miami a flight of five F9F-5s elected to set down at NAS Jacksonville due to the leader's low fuel state. Taking the gas chits to the transient line shack the flight leader requested that only the main fuselage tanks be filled, leaving the tips empty in order to expedite the departure. This action was taken prior to getting a weather briefing.

"After a quick round of sandwiches and coffee the pilots trooped topside to aerology. A cold front was passing MIA but was to be past by the flight's ETA there. With this adverse weather reported at Miami the flight filed and rushed out to the planes (with their empty tips).

"Takeoff was executed individually after sunset and a night running rendezvous effected. After leveling at the assigned altitude of 24,000' and flying for about 10 minutes, the jets ran into scattered to broken layers of clouds and the leader requested clearance to 27,000'. This was granted but in the climb the number 2 man called that his radio was cutting out and shortly after reaching 27M he failed to answer several radio checks. However he remained on the wing of the leader with no other apparent difficulty.

"The higher altitude did not lift the flight out of the soup and the leader called for 30M and was so cleared. Shortly thereafter ATC cleared the flight to New River intersection, off the course of the original flight plan, and from there direct to the Miami low frequency range to hold for an indefinite time at 30M. On passing Daytona Beach we entered a large thunderhead and all flight integrity was lost.

"Coming out of it, the scattered jets rejoined and fuel checks indicated that no man had more than 1400 pounds of fuel remaining though the state of Number 2 man could only be guessed. Vertigo took over with three members of the flight, but they were able to remain in loose formation.

"An immediate penetration to MCAS was requested by the flight leader and approved. The leader and number 2 man started down

. . . the duty runway required an unfamiliar right-hand pattern . . .

Continued from preceding page

first. Number 2 was unable to recognize the speed brake sign and shot out to the side but luckily was able to rejoin before the overcast was entered.

"The second section of three aircraft made a 360-degree turn and followed the first section down the coal chute. Low fuel warning lights cheered up each pilot at the start of the penetration, indicating only 1050 pounds remaining and making a missed approach impossible for anyone.

"Fortunately the ceiling at Miami had gone up enough to permit a VFR heading from the range to field but one problem remained. The leader was the only one in the flight who had ever flown into Miami before and since the fuel state permitted no wandering around, the second section leader obtained a steer from Miami approach control into the proper field.

"Then upon switching to tower frequency it was learned that the duty runway required an unfamiliar right-hand pattern and in the ensuing landings two aircraft blew tires as a result of too much airspeed in the 'strange' approach. A third pilot required a tire change from extreme wear due to excessive braking on his hot landing.

"All pilots were able to walk away from their planes but not without many misgivings about division instrument work in an unfamiliar area, at night, without radios functioning properly and with insufficient fuel. All pilots agreed that under similar circumstances in the future they could leave their aircraft on the deck when the destination reported IFR weather and there wasn't enough fuel aboard to make it *safely*."

AMEN

"SEAPLANE pilots are the forgotten men of the air! Very often no preparations are made for handling the aircraft until after it arrives resulting in delays that often amount to several hours. Duty people at destination air stations which also operate land fields often completely ignore seadrome conditions and fail to advise the inbound seaplane pilots of weather conditions in the seadrome which often differ materially from those existing on the field.

"One seaplane departed Bermuda for a U.S. station with forecast and terminal weather received enroute indicating good conditions. On arrival the field was clear but fog was observed over the seadrome. Visibility in the seadrome was reported at 500 feet.

"Hourly position reports had been sent to destination with a request for ramping included in one. The aircraft was required to divert 300 miles to the nearest alternate."

CHOCK TALK

A FELLOW told me of a cross-country incident in which there were no chocks on the line so he set the parking brakes. Results: brakes frozen to the drum. Remedy: Don't set parking brakes while they are hot.

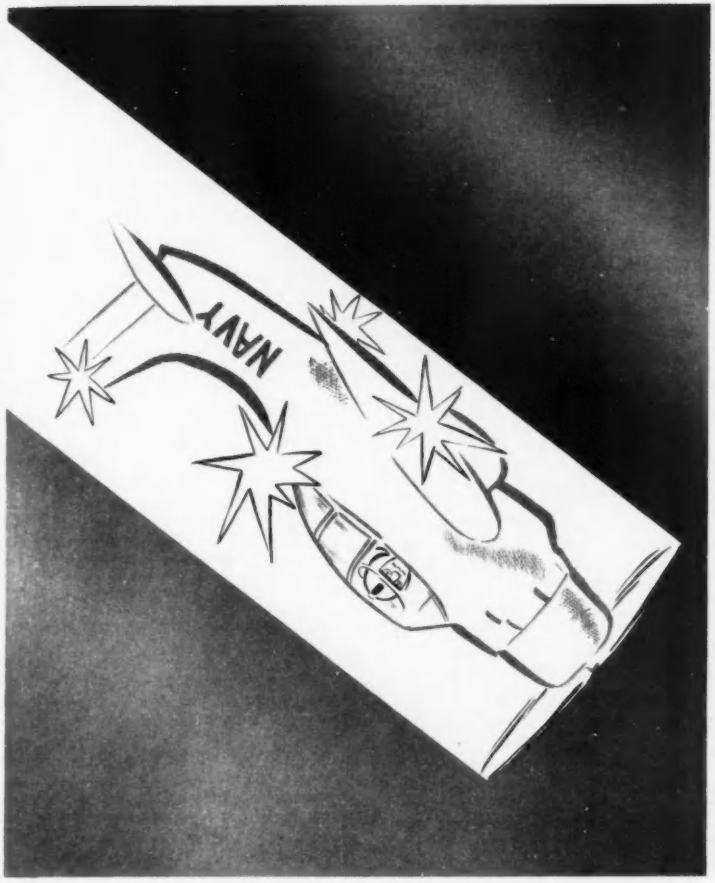
I went on a ferry flight and at the destination there were no chocks but remembering my friend's incident, I did not set brakes. Results: Plane rolled back into telephone pole damaging port elevator. Remedy: If no chocks are available, sit in the aircraft until brakes are cool then set, or better yet, get chocks at all Navy fields.

CHASE RECOMMENDATIONS

I WAS flying a practice instrument hop VFR in an FJ-3 with a chase pilot close behind. Since I had no bag aboard, I had the seat all the way down and kept my head in the cockpit to simulate IFR. Entering a normal holding pattern at 20,000 feet, I was flying outbound when I heard Chase say in a normal speaking voice, "Pull up."

His tone deceived me and, thinking that I had inadvertently dropped below my altitude, I checked my altimeter. Chase immediately repeated his call (in little more than the same tone of voice) and I pulled back on the stick, glancing off the left in time to see two FJs flash by just beneath.

I fully realize that I am open to criticism; however my purpose is to make two recommendations: (a) If you are a chase pilot and see a dangerous situation, let your voice reflect the urgency of the situation, (b) If you are flying instruments and receive instructions from your chase pilot, comply NOW and think about it later.



VERTIGO AGAIN

I LAUNCHED for a field 600 miles away to take two passengers there on official business. Takeoff was at 1030 and the AD-5 took three hours for the trip with tailwinds knocking 10 minutes off my ETA. This portion of the trip was uneventful but was setting the stage for what happened later.

After landing my two passengers went about their business while I closed out and refueled the aircraft. When my passengers returned I had refiled and was going to get some lunch but grabbing an ice cream bar, I went to the plane and we launched for the return trip. Weather at home base was IFR but I didn't sweat because it was home and I'd gone in there IFR many times.

I checked in with approach control over the homer at 9000 feet and they passed me to GCA. GCA said they had me and would control my descent. I was given a right turn to 120 degrees and a descent to 2500 feet then, as I started to turn, I was given a 270-degree spacing turn to the left because of an aircraft ahead of me.

Turning to the left, I took my eyes from my attitude gyro to check my G2 compass. At this time I went into the soup and my bright flashing fuselage light further distracted me. Then vertigo struck and I rolled on my back before I got my scan back to the attitude gyro. I knew something was wrong but not until I saw the vertical speed needle pegged at 6000 feet/minute DOWN and the altimeter unwinding!

Raw panic hit me then, but fortunately I didn't freeze. When I had recovered from this unusual attitude and was straight and level again I was at 1500 feet and scared blue (I recovered by instinct "a la training command"). When I settled down I went on with the GCA and made a rough but otherwise uneventful landing.

This hairy experience was not caused by any one thing but by a number of little things resulting from complacency. First of all, I had only 5 hours' sleep the night before and second didn't eat lunch. Third, I was tired from 6 hours of steady (almost) flying behind me. Fourth, I had my lights on bright flashing when I went into the soup and fifth, I let myself become distracted while on the gages.

This was my first case of vertigo, by the way, but I was lucky and only had the wits scared out of me. Words can't describe how scared I was. I was numb and my skin crawled and I can remember thinking "I've killed myself and two innocent passengers." It's happened to people before and will happen to people again but I can say that I will never get vertigo again from these same causes. I think I'm safely over the 500-hour hump now.

Watch for a major APPROACH *feature coming on vertigo. Meanwhile, your personal vertigo experiences are always welcome.—Headmouse*

HEADMOUSE

Have you a question or a technical comment concerning aviation safety? Send it in to Headmouse and he'll do his best to help.

Dear Headmouse:

A RECENT accident has brought up two procedures which probably cannot be legislated against, but which seem to be contrary to the interests of safety.

(1) Witnesses' statements are often changed, modified, proof-read, and corrected from the time the accident occurs until the smooth AAR is completed. (In my opinion an ideal statement would be recorded on tape within one hour after the accident. A less accurate, but more practical solution, would be a statement handwritten by the witness within 4 hours after the accident. These original handwritten statements should be forwarded with the AAR!)

(2) All members of the accident board may be officers in the department concerned in the accident. In one case the standing accident board included the Maintenance Officer, but when an accident occurred he was dropped in favor of a third officer from the Operations Department. This was done in spite of the fact that no maintenance errors were suspected but operational policies may have been a contributing factor. (In my opinion the accident board should always include a squadron officer who is not subject to fitness reports of the department head most likely at fault.)

ANYMOUSE

The fact that an AAR cannot be used for legal or disciplinary purposes does not also excuse it from being a proper "legal" instrument for the purpose for which it was intended — aviation safety. And any statement which is altered or modified by others is no longer the true statement of the person originally making it. Accident boards can defeat the purpose of aviation safety by making or authorizing such changes, and are also exposing themselves to challenge by witnesses who find their words altered. As to item 2, a properly constituted Board will have one medical officer (preferably a flight surgeon) who normally is not subject to the fitness reports of a squadron department head. In the case you cite, many objective reasons unknown to us (and possibly to you) could exist to justify the substitution. We admit though, that based only on the facts contained in your letter, there is cause to suspect an oversize mouse. OpNav Inst. 3750.6C will define Board members more specifically.

Very resp'y,
Headmouse

Dear Headmouse:

Just read "A Case of Precedence." I have a question concerning aviation safety TODAY.

BACKGROUND: I'm an airborne intercept operator flying in an F3D twin jet all weather fighter. Broke in in F7Fs. Only 1100-odd hours flight time in six years. Formerly was an aircraft mechanic; even line or engineering chief.

But I remember one squadron's procedures when I was just (?) a plane captain. Weekly inspection of the mech's tool box. Results were twofold. Missing or damaged tools were replaced. AND missing tools were searched for to obviate just such an incident as "Precedence" cited. Plane captains worked on 3 planes (one section) at most, and it was readily discernible which particular aircraft a mech had worked on the preceding week. IF a tool were missing, we knew what to look for and where.

One other observation of a former (and perhaps future) mech. Bolts were installed in aircraft according to instructions — from front to rear if I recall correctly. Just noticing bolts in landing gear door hinges, I wonder—some are front to rear and others rear to front, hit or miss. Some use castellated, others elastic stop nuts, hit or miss. But the kicker—many bolts AND screws in the exterior of the aircraft are *RUSTED*. Is this allowable? Is this safe?

No Anymouse forms available.

LEWIS SLEPIN,
MSgt, USMC
Cherry Point, N. C.

Your points are well taken, Sarge.

► Tools—*should be inventoried after every job on an aircraft. Mechanics should apply the same procedures a surgeon uses after an operation on his patient, that is, use a checklist and account for everything, this means tools, nuts, bolts, washers. . . .*

► Bolt Installation — *Complex components often require special design to allow for clearances, movement, inspection, etc. Aircraft blueprints must conform to Design Specs approved by Chief, BuAer. However, where drawings and blueprints do not specify otherwise, and wherever possible bolts should be placed with head on top or in the forward direction. This will prevent a bolt from slipping out if the nut is accidentally lost—ref. Technical Inspection Manual, of Aircraft Components, Nav Aer 00-15 PH-500.*

► Self-locking Nuts—*According to Aircraft Structural Hardware Manual AN 01-1A-8, these too may be used in those locations where their use is specified by the manufacturer on his assembly drawings, or the Parts Catalog for a particular type and model aircraft. (Note that the instructions of this Handbook are to be considered as general and applicable* except *as specified by the Manual for the specific aircraft. In cases of conflict, the HMI governs in all cases.)*

► Rust—*Good maintenance practices certainly would keep rust under control as rust is a sure sign of deterioriation. Sound judgment should be exercised to determine its effect on safety.*

Very Resp'y
Headmouse

P
p
o
u
N
B
H
K
R
R
M
L
S
F
L
H
P
D
S

Wheels-up Landings

SAVES

BOX SCORE

Wheels-up landing, unintentional, pilot induced

April 1957	3
April 1958	3

RECENT statistics of the U.S. Naval Aviation Safety Center show that for every unintentional, pilot-induced wheels-up landing, there are SIX wheels-up approaches which are waved off.

The records make very plain the functional value of wheels-watches. This month *Approach* recognizes the below listed persons for having prevented a wheels-up approach from becoming a wheels-up landing, at the place, by model aircraft involved, on the dates shown.

NAME	STATION	ACFT	DATE
BRUNK, R. H., AD2	NAS Olathe	F9F-6	2/11/58
HEINTZELMAN, J. E., AN			
KING, J. L., Civ. Fireman			
RUSSELL, R. R., AC3	NAAS Corry	SNJ	2/14/58
RUSSELL, R. R., AC3	NAAS Corry	SNJ	2/21/58
McGRORY, C. J., DC3	NAAS Corry	T-34	2/24/58
LTJG W. A. DERN	NAAS Corry	T-28	2/21/58
SARGENTI, E. D., ACT3	NAS Alameda	SNJ	2/23/58
FISCHER, P. D., AN	NAAS Brown	AD-5W	2/12/58
LT R. R. McFARLANE	NAS Columbus	FJ-2	2/22/58
HALL, A. F., AC3	NAS Olathe	NA	3/2/58
PARSONS, H. E., ADR3			
DUNCAN, C. B., AN			
SUDDARTH, C. E., Civ. Fireman			

NAME	STATION	ACFT	DATE
LTJG E. SENN	VA791, NAS Memphis	AD5W	3/16/58
SCHNURBUSCH, R. J., CS3	NAS Oceana	F9F-8	2/24/58
JOHNSON, G. L., AE3	VF191, NAS Moffett	AD-6	3/13/58
GARRETT, M., AM3			
LATIONAIS, H., AN	NAAS Kingsville	S2F	NA
HEIDELBAUBER, W. R., AA	NAAS Kingsville	S2F	NA
GEORGE, H. C., HSSA			
MOYERS, R. E., AD2	NAAS Kingsville	S2F	NA
HOUSERIGHT, R., DC1	NAS Willow Grove	F9F	4/2/58
LODEN, J. C., ACCA	NAS Dallas	F9F-6	4/5/58
GARDNER, B. Y., SN			

1. What is summer's danger to night vision?
2. Why on earth would anyone wear a life jacket, helmet, belt and harness to taxi a plane down the flight deck?
3. What is hyperventilation — why is it dangerous?
4. What do "hyper" and "hypo" mean?
5. With fuel fumes in the cockpit, 100 percent oxygen creates danger of an explosion. (True or False)
6. When descending in a wooded area the legs should be held together, and the face protected by:
   a. A face mask
   b. The arms
   c. Holding face down
   d. Tucking your legs against your chest

See Answers page 32.

truth
consequen

A DIGEST OF SIGNIFICANT AIRCRAFT ACCIDENTS

th
uel

and
nces

THEY CAN MAKE IT — Poor weather prevented a flying boat from departing on a scheduled overwater student may hop. However, the inland weather was satisfactory and the pilot received permission to fly an overland route. An eight-hour IFR round-robin was planned with takeoff made shortly before noon.

Scattered thunderstorms with light to moderate turbulence were forecast for the route. Weather for the aircraft's ETA back at home base was forecast to be 900 broken, 3 miles in rain showers with 10 to 15 knots southwest winds. The alternate, 600 miles from home base, was forecast to be 1000 broken, 7 miles with a 10-knot south wind.

After departure the flight was routine. Hourly position reports were made to the air station in addition to the required CAA reports. The pilot periodically checked the air station weather which from all indications, agreed pretty much with the forecast. Communications were good except that there was no contact with the seaplane tower. The squadron duty officer received the hourly position reports including an ETA of 2226 that night.

In anticipation of the aircraft's arrival the duty officer had the seadrome lights laid into the wind on a southeasterly heading in accordance with the latest wind forecast. When the lights had been laid, the crash boat duty officer noticed a heavy dark storm line on the horizon to the west and southwest and he informed the squadron duty officer that a change in the wind line might be necessary. It was agreed that a weather check would be made and if a change was necessary the word would be passed.

By 1845 there was a build-up in wind and sea which eliminated the possibility of changing the sea lane lights. At 2000 a squall line, followed by a sudden increase in wind (22 to 30 knots) and shift to the northeast, passed through the station. At 2130 the crash boat duty officer took station out near the sea lane and reported a sea state of 4 and building, with visibility one quarter mile in rain squalls.

At 2200 he reported a sea state of 5 with the major swell system from the north and a northwesterly cross chop augmenting it. The aircraft was sighted on its approach and the boat officer reported he was unable to maintain a fixed position due to the seas which set the 40-foot boat on its beam's end when lying to in the troughs. After a missed approach the aircraft climbed on a northerly heading. The boat officer was advised that the plane intended to make another approach and that the winds were 40 to 45 knots in gusts.

At this point it is of interest to backtrack a bit and switch over to the aircraft. At 2225 the plane reported over the range station at 8000 feet and the pilot contacted approach control for a low freq approach. He was cleared for an approach and given the latest base weather as 500-foot, broken, 10 miles visibility, northeast wind at 25 knots with 4-foot waves in the seadrome. The accident board noted that from this report there was no reason to question the pilot's decision that a safe landing could be made in the seadrome.

During the letdown a heavy rain shower was passing through the seadrome with consequent reduced visibility and the aircraft was held at the range station for 5 minutes until the shower passed.

Final approach was ASR controlled with a landing heading of 40 degrees (into the wind). Initial touchdown was followed by three or four bounces and a

Continued from preceding page

waveoff was taken. Next approach was made VFR on the same heading and after three or four bounces the pilot used reverse pitch and brought the aircraft to a stop. The aircraft did not then appear to be damaged as a result of the hard landings. Crew reports indicated the waves to be 5 to 6 feet high rather than the 4 feet previously reported.

The winds were not expected to die down until early morning and it was considered dangerous to attempt to ramp the aircraft until then. During the night the water became rougher causing considerable rolling and pitching which resulted in some water being taken aboard through the tunnel hatch. By seven o'clock in the morning the wind had dropped to 15 knots from the northeast and shortly thereafter the aircraft was ramped. Damage from the hard landings was found on top of the hull forward and in the starboard engine nacelle.

Conclusions by the board were that the primary cause was rough water conditions and secondary cause was personnel error in failing to notify the pilot that water conditions would prevent the aircraft from being beached.

One paragraph in the board's analysis concerned this personnel error. The squall line, said the board, followed by the sudden increase in wind velocity and wind shift, passed through the seadrome around 2000 local time. Radio communications with the aircraft were very good, yet no effort was made to pass this information on to the pilot. A flight advisory should have been sent by the unit duty officer advising the pilot of the rough seadrome conditions. This would have given the pilot two hours advance notice to plan on flying to his alternate.

Said the pilot "At no time during the flight had I received any weather information that my terminal conditions had changed any whatsoever from the forecast. The alternate was not considered due to en route weather, which was avoided by the flight, and water conditions, as reported, were quite satisfactory for a landing considering the weight of the aircraft. . ."

COMPLACENT — The Alpha Delta has been around longer than most service aircraft and appears to have a few more years left on duty; so this accident is presented on the recommendation of the board that it be given wide dissemination as an example that "it *can* happen to you."

As the Fleet Air Commander noted, "this accident, as are many pilot-error accidents, is apparently the result of complacency on the part of the pilot. In view of his experience in this aircraft, there is no other reasonable explanation for the failure of this pilot to recognize and correct the situation as it developed."

The pilot concerned was on his 31st month in the squadron and had slightly over 1000 hours in ADs. After completing nine approaches during night FCLP he was told to remain on deck following his next mirror approach and landing. Receiving the cut, he eased the nose over and flared to a three-point attitude.

After initial touchdown the AD-6 swerved to the right. We take up the pilot's statement from that point.

"I immediately put in full left rudder, gradually easing my foot up onto the brake. Upon application of the left brake I determined that I wasn't getting any results so I just sat tight, continuing to hold in full left rudder and pumping the brake."

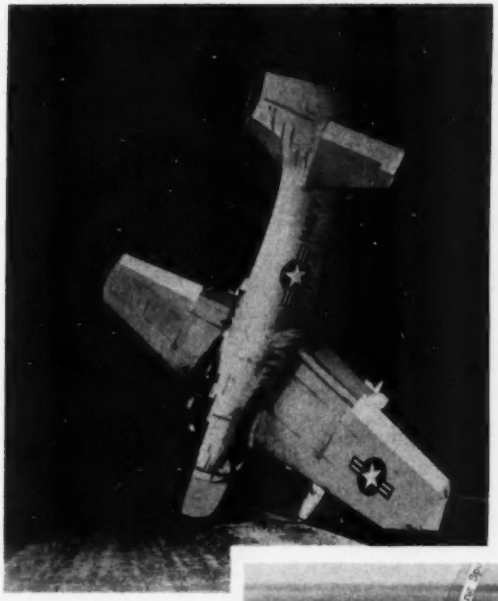
The right swerve continued until the right wheel went off the runway onto a graveled shoulder. Then the aircraft heading paralleled the runway for some 200 feet where it nosed up, coming to rest balanced on the prop, port external fuel tank and port wingtip.

Braking marks left by the tires indicate that the right tire skidded for a short distance after the swerve started. Then there were no skid marks for a short distance and finally, both tires showed continuous skid marks going off the runway and up to the point of nose-up.

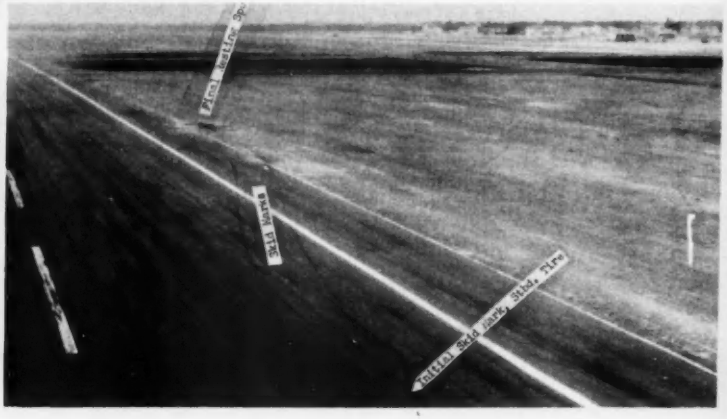
During FCLP operations the air was reported unusually smooth. By comparing the pilot's statement with evidence at the scene the board established a sequence of events which apparently led to the nose-up.

- The approach was normal but the aircraft was slightly high at the cut.
- The landing was full stall with "some" slipstream.
- The plane bounced and pulled to the right.
- The pilot "immediately put in full left rudder."

In explaining the skid pattern the board felt that when full left rudder was applied, the right brake was pushed back against the pilot's foot, depressing the brake and causing the right tire to skid, pulling the plane farther to the right. Then the pilot gradually eased his left foot up on the brake. In doing so, he undoubtly had to ease some rudder



Full rudder application resulted in inadvertent application of opposite brake. Note the skid marks . . . and the adroit use of salvage gear for the letdown.



pressure. This would account for the absence of tire marks.

He then applied left brake with full left rudder held in and this again pushed the right brake pedal back into his right foot. Dual skid marks are mute eviduce to this fact.

While the pilot was waiting for results and debating whether to add power, the plane's starboard wheel ran off the runway. At this point the port tire had greater traction than the starboard tire which was on hard packed gravel. The AD-6 straightened its course parallel to the runway. Both tires continuing their skidding until nose-up occurred.

The board concluded that improper rudder pedal adjustment and improper technique were used. Rudder pedals should be adjusted for full rudder throw and full brake throw when the leg and foot are extended. Any adjustment beyond this will not allow the pilot to use full rudder and brake simultaneously. Not Any adjustment less than this will place the pilot in jeopardy of the possibility of inadvertantly applying opposite brake when full rudder is used.

Other conclusions were that under light wind conditions, and having been at the 180-degree spot with the plane ahead at the 90 degree position, the pilot should have been alert for slipstream and directional control difficulties upon landing. The pilot debated applying power, while his directional control deteriorated. He was not alert to a possible directional control problem as *every* pilot must be on *every* landing.

WHIPLASH—Two FJ-4B airplanes were conducting an inflight refueling at 32,000 feet.

Continued from preceding page

The receiver airplane's canopy was struck by the tanker's drogue after an unsuccessful plug-in.

The receiver airplane missed an attempted plug-in and overran the tanker airplane's drogue, which went beneath the wing of the receiver. The receiver airplane reduced airspeed in order to return to the initial position for a second plug-in attempt. As the receiver's speed decreased, the drogue came from beneath the wing. However, the airflow about the receiver airplane induced an oscillatory motion in the drogue and it struck the receiver airplane's canopy.

All pilots are cautioned that on unsuccessful plug-ins, they must properly position the receiver airplane relative to the tanker before reducing airspeed and easing back to the initial position for another plug-in attempt. However, because of the difficulty in obtaining plug-ins with the FJ-4B, and because of the airflow about the wings and canopy of the airplane, there exists a high probability of future occurrences of this type.

BLOW-BACK — This one happened in the fuel pits. The F4D pilot pulled into the area, stopped, then went through his shutdown procedures. He ran the engine up to 80 percent for one minute then brought the throttle around the horn to OFF and let the engine completely decelerate. He then turned the master fuel switch and battery switch OFF and secured the cockpit. About this time the pilot noticed a fire in the tailpipe.

A starting unit is normally on hand to be used in blowing out residual fires but the starting unit had just departed to assist a plane on the runway. Luckily the pilot was able to hail a fire truck and the fire was extinguished. CO_2 bottles were available but through the excitement of having an aircraft on fire in the fuel pits, these were forgotten and foam was used.

Likeliest reason for the fire was a six-to-ten knot tailwind blowing up the tail section. This caused unburned fuel vapor to re-enter the hot section and ignite after engine shutdown.

After the incident (which required an engine change) the parking positions were modified.

The following precautions were recommended:

► Re-emphasize the proper shutdown procedures to reduce to a minimum the likelihood of residual vapor igniting on shutdown.

► Insure that regardless of circumstances, a starting unit is always available.

► Insure that all pilots and ground personnel working in fuel pits are indoctrinated in the proper procedures for extinguishing a fire on shutdown.

CHURNING UP — Cleared for takeoff, the pilot of a JD-1 applied power and began rolling down the duty. Upon reaching approximately 125 knots, and believing the aircraft to be safely airborne, the pilot raised the gear.

The aircraft settled slightly, causing the port prop to strike the runway. Though the pilot realized the aircraft had settled on takeoff, he was unaware that the prop blades had struck the runway. After a 1.7-hour flight, during which engine instrument and performance was normal, the JD-1 was post-flighted and all port prop blades were found to be worn down about one inch.

FLIG

. . . At 1020E, 27 Jan 58, the Duty Operations Officer at the Olmsted Flight Service Center received a call from the Police Department of a medium sized city in eastern Pennsylvania. The reporting official stated that a jet aircraft buzzed the city at 0928E at an altitude of somewhat less than 200 feet. He further stated that interrogation of witnesses in the area failed to positively identify the aircraft because of the terrific speed and proximity with the ground.

Subsequent investigation by Flight Service revealed the aircraft could have been one of a possible six. Whoever said, "There is safety in numbers" never realized how it would apply to a situation like this. The identity of the aircraft and/or pilot could not be determined. So for his benefit and for the caution of others, his "buzz job" caused one fatality resulting from heart failure and one casualty when an invalid was jolted out of bed. Just think, all this without even firing a shot!— *Flight Service Bulletin, Jan '58*

Situation:

During the past 60 days there has been a "rash" of irregularity reports some resulting in official violations, others being resolved

HT VIOLATIONS

Every agency involved in flying operations, both military and civil has devoted fantastic amounts of time and material in the interest of flying safety. Every individual that flies has been indoctrinated and reindoctrinated with the subject of flying violations. Yet in spite of the numerous regulations, publications, conferences, advisory committees and meetings the information just doesn't seem to reach everyone.

by the pilots concerned, and the Flight Service Operations Officer at the termination point of the flight. The following typifies some of the explanations offered by pilots when affronted by Flight Service.

Complication:

"Didn't know there was a new AFR 60-16, OpNav 3710.7A, AR 95-8."

"I've been flying 15 years and never heard of that before."

"I haven't got time to talk about it, I'm real busy."

"Why don't you guys fly the desk and let me fly the aircraft?"

"I made it, didn't I?"

Assumption:

It is indicative that many pilots are unaware of the pertinent changes to their flying regulations. As a result, flying safety is to be compromised, and our already "greying" Flight Service Operations Officers are rapidly "balding."—*Flight Service Bulletin*

Before . . .

. . . pilot flew his helicopter in such a manner as to convince ship personnel that their lives were endangered. He made three passes at a tanker at an altitude estimated lower than mast top. The tanker was in the process of unloading 27,000 tons of aviation gasoline.

. . . And After

. . . pilot was restricted to his quarters for a period of 10 days . . . in addition his Helicopter Transport Commander's rating was revoked.

* * *

Before . . .

. . . pilot deviated more than 10 miles from the centerline of the route of flight while operating within a domestic ADIZ on a DVFR flight plan . . . in so doing he flew through an Atomic Energy Prohibited Area so designated by Executive Order.

. . . And After

. . . pilot was assigned additional collateral duties commensurate with the nature of this violation in that he will brief all squadron pilots on prohibited areas and ADIZ procedures. He will also review all squadron cross-country flight logs to insure that adequate pre-flight planning precludes future incidents of this nature. An entry has been made in the pilot's flight log book.

OpNav Inst 3750.5A—"It is to be noted that lack of intent does not in itself constitute absence of culpability. The question to be answered is whether the pilot in command of the aircraft or formation of aircraft, in the light of the authority and responsibility held by him as such, could have been reasonably expected to avoid the violation."

OpNav Inst 3760.1A — "Military personnel will report any violation of flying regulations that come to their attention."

OpNav Inst 3710.7A — "Resorts, including beaches, shall be avoided by at least one mile when at altitudes of less than 2000 feet above the terrain, except as overflown in normal en-route flight on airways or other point-to-point flights, or in compliance with an approved traffic or approach pattern."

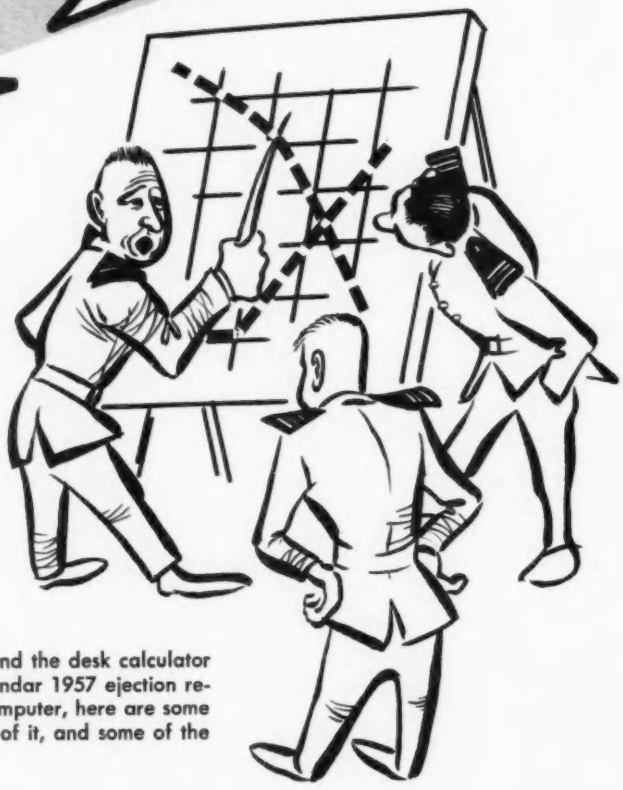
OpNav Inst 3710.7A—"Acrobatics —Consists of intentional maneuvers other than:

(a) Normal flight

(b) Diving and recovering maneuvers as necessitated by gunnery and dive bombing or other tactical exercises.

. . . All acrobatic flying performed in naval aircraft shall be conducted within the limits of designated acrobatic areas. No naval aircraft shall be flown acrobatically unless approved by a properly designated representative of the officer controlling the acrobatic area."

EXIT REPORT



The IBM machines have completed their runs, and the desk calculator is silent. The facts are all assembled in NASC's calendar 1957 ejection report. If the report could be fed into an electronic computer, here are some of the questions that you as a jet aviator might ask of it, and some of the answers it might give—

Can I Get Out Successfully at Any Lower Altitudes?

YES! Statistics in calendar year 1957 show an encouraging improvement in the minimum altitude. Better than 96.2 percent of the ejections above 1200 feet were successful. Studies previous to 1956 showed that beginning at 5000 feet ejection fatalities increased progressively as the altitude of ejection decreased. The latest study indicates that this progressive relationship between altitude and fatalities no longer holds. Instead, statistics in the study show an all-or-none pattern of ejection.

Ejections at altitudes *below* 1000 feet are almost certain to result in fatalities regardless of speed, attitude and automatic equipment whereas ejections *above 1200* feet are 96.2 percent successful.* In the 200-foot zone between success and failure (altitudes between 1000 and 1200 feet) chances for survival are 50-50.*

While 1200 feet gives you a very good chance, if

you can eject at 2000 feet or above you'll get optimum functioning of your ejection equipment!

Did Auto Gear Help Lower the Minimum?

While it isn't possible to prove that the improvement in the fatality percentages between 5000 and 1000 feet is due to it, it's a very reasonable assumption, since the new equipment appears to be the only systematic variable that has been introduced into the ejection system. While not covered in the report, it would appear that our increased experience and training in this process is a factor, and thus should not be relaxed!

What Percentage of Ejectees Had Auto Gear?

In the 127 successful ejections made in 1957, 121 pilots had automatic lap belts. Only forty-eight had *both* automatic lap belts and automatic parachute actuators.

What's The Story on Martin-Baker Seats?

Due to the fact that no Martin-Baker seats were involved this information was not covered in the 1957 research study. However, there's much being done—This presents nightmarish design equipment, retrofit and training problems—a full report will have to come later, when we can get it.

How About Injuries and Fatalities?

Though the percentage of fatal ejections decreased slightly the overall ejection fatality rate per 10,000 hours again increased due to the greater number of ejections. Thus, in 1957 there was one fatality per 43,478 hours flown, as compared with one per 45,454 the previous year.

But on the other hand there has been a substantial decrease in the number of serious injuries resulting from the force of the ejection seat mechanism. Possibly this is due to training.

The ejection seat study shows that landing-drowning accidents cause the greatest number of serious and fatal injuries. This fact is related to the high fatality rate of low level ejections.

The provisions of OpNav Inst. 3750.12 of course encourage ejections in appropriate situations. This costs us an aircraft, but the record clearly shows the odds are that forced landings of high performance jet aircraft result in strike damage anyway—and of greater importance, pilot ejections are 81.9 percent successful as against only 50 percent survival for such forced landings.

* There have been three successful ejections accomplished at altitudes of only 800 to 1000 feet so far in calendar 1958, and three unsuccessful ones.

Continued from preceding page

What Is the Most Likely Reason I'll Have to Go?

Engine difficulties necessitated the greatest number of ejections in 1957. The second leading cause was loss of control of the aircraft. The remaining ejections were due to fires, explosions and mid-air collisions. (There were 16 mid-air collisions of aircraft and two collisions of aircraft and tow banners.)

In 1957, there were 57 ejections from the following six Navy aircraft—the F3H, F4D, FJ-4, F8U, A4D and F11F. The ejections were 86 percent successful as compared with the overall Navy percentage of 81.9 percent.

Are Higher Speeds and Altitudes a Problem?

The average speed of ejections has shown no increase in the past four years despite the newer high performance aircraft in the Navy. The altitude increased slightly.

The average speed at which ejections were accomplished in 1957 was 241 knots. The average altitude was 9000 feet. Both figures are well below the operating capabilities of the aircraft.

There is no apparent relationship between speed and injuries. This can be accounted for by the general lack of high speed ejections that were high enough to factor out altitude.

What About Attitude?

Except in low level ejections, the attitude of the plane at the time of ejection seems to be of little importance at the present time.

What Happens If I Lose My Oxygen Mask?

The five pilots reporting ejections at between 30,000 and 35,000 feet lost their oxygen masks. Two pilots opened their chutes above 28,000 feet, but no difficulties due to lack of oxygen were reported. As the number and altitude of high speed ejections increases, the loss of oxygen equipment will become a more common problem. Steps to correct mask loss are being evaluated.

What Recommendations Did the Report Make?

1. Continued research to develop low altitude equipment designed to function under the severe conditions encountered in ejections below 1200 feet.

2. Equipping all pilots with completely automatic ejection equipment as soon as possible.

In the meantime, both pilots and maintenance personnel must be constantly reminded of the importance of proper preflight inspection to assure that the equipment will work if needed. It has been recommended in some quarters that aviation units consider holding inspections in full flight gear much as is done in dress blues and whites.

Where Can I Get More Info?

Your flight surgeon has a copy of the complete report, NASC No. 666. Additional copies are available on request to Commander, NASC, Attn: Aero-Medical Department, NAS Norfolk 11, Va. No need to send one to your favorite aircraft manufacturer—both he and BuAer received them. Other APPROACH articles on ejection include *Curtain Call*, May 1957, *When You Gotta Go*, July 1957, and *Mach Knock*, June 1956. Some back copies are available.

Answers to Whiz Quiz, page 23

1. Sun, especially reflected from water. It may take hours for your night vision to recover, so wear sunglasses.
2. To stay on earth. Insurance has been paid because a taxiing plane went over the edge as a carrier turned, or brakes failed. (August 56 page 38)
3. Overbreathing—that is breathing hard and fast, often from anxiety and occasionally from breathing against pressure. It can end in unconsciousness. (December 56, page 37 Approach)
4. "Hyper" means excess, over, above, *beyond normal* as in hyperventilation, hypersonic, hypertension (high blood pressure.) "Hypo" means deficient, under, beneath, less than normal, as in hypodermic (under the skin), hypoglycemia (low blood sugar), hypoxia.
5. FALSE. Use of 100 percent oxygen excludes all cockpit air, and fuel fumes with it.
6. (b) The arms.

DO YOU DRESS THE PART?

WITH THE coming of summer and the really hot weather, the beach crowd and the sunworshippers begin to unpeel their clothing and expose more and more of their hide. This molting, particularly of the female of the species, meets with the complete approval of the modern birdman and often to such a degree that he too begins to drop his winter plumage for the lighter and breezier coverings. This is fine and in all probability will cause little concern save a sunburned shoulder or two. However, to carry this switch to comfort into aircraft is a bit more serious, and is certainly cause for careful study.

One fire-in-flight accident reemphasizes the necessity for wearing *all* of the proper flight clothing on all flights regardless of the temperature at the local beach. The pilot, in this particular incident, had been airborne on a combat air patrol flight in excess of four hours. During a break he took off his right glove to enjoy a cigaret.

Shortly after finishing the cigaret and before replacing his glove; a rough-running engine, smoke, flames around the air intake and then fire in the cockpit followed in quick succession. The pilot abandoned the aircraft as quickly as possible, but not, unfortunately, until he had sustained severe burns to the exposed right hand. In addition to this painful injury, his eyebrows, eyelashes, wrists and ankles received first degree burns from the flash fire.

This pilot is lucky for, although he received extended medical treatment, no permanent damage was done. You and I may not fare so well. Consider then—during the winter months we wouldn't think of leaving the ready room with the sleeves of our G-suits rolled up, sunglasses perched on our noses and flight gloves stowed in the locker room. Reason? Obvious. We'd freeze on the way to the aircraft. Why then, when we realize that shortly after takeoff we'll be operating at an altitude where the outside temperature gives little clue to the season, do we jeopardize our chances of survival in a high-altitude ejection, a cockpit fire or a fire in an emergency landing?

It boils down to one simple fact. The need for a uniform policy within the pilot's unit and the need for supervision. Sure, you can comply with every directive in existence, and be pretty comfortable on the promenade to your aircraft, but brother if you think that G-suit alone is going to protect you from a flash fire or the deep-freeze treatment of a high altitude bailout, you're dangerously mistaken.

Remember gents, it's better to be careful a thousand times than to get burned just once. Each item of your flight clothing is designed to afford you the protection you need from the elements you operate in. Give yourself the break you deserve by wearing it correctly.

Suggested and highly recommended summer dress for the modern VF-VA pilot.

1. Cotton underwear
2. White woolen sox and field shoes
3. The anti-blackout suit
4. The summer flight suit
5. Flight gloves
6. Anti-buffet helmet
7. Life vest for over water or coastal area flights

In all this gear you'll perspire a bit profusely and you'll be temporarily uncomfortable, but you'll be affording yourself the best protection short of not flying.

Go to the beach in your Bikini trunks and get your yearning to return to your ancestral dress habits out of your system, if you must, but when you fly, let's get down to business and dress for the occasion (unexpected type).

Preflight planning and takeoff at 0755 were uneventful. Except for a weak transmitter, the hop was interesting and enjoyable until, as the morning wore on, the cockpit began to get hot.

About three and a half hours after takeoff, the chase pilot began to develop a headache. He figured this was caused by the tension of flying chase plane at an altitude of approximately 200 feet. He notified his flight leader and believed he had gotten through to him but probably did not.

About a half-hour after the onset of his headache, which by now was becoming very intense, he began to feel nauseated.

Deciding at this point that he might be developing carbon monoxide intoxication, he cracked open the canopy, put on his oxygen mask and went on 100 percent, but there was no relief of his symptoms.

He sent a number of unacknowledged transmissions to his flight leader.

Finally he said, "I'm sick. Let's turn back."

His flight leader acknowledged and they climbed to 1000 feet.

Although it was cooler at the higher altitude, he felt only slightly better.

An hour and a half later, the AD-6s approached home base.

• • • • A

SALTY YARN

AT 0645 on a Monday about a year ago, a young Ensign was notified that he was to fly chase plane on a five-hour special weapons low-level navigation hop in an AD-6 scheduled for 0730 takeoff. The pilot originally scheduled had just been grounded for medical reasons.

In the pattern, the chase pilot was very slow to respond to transmissions from his flight leader. Unable to locate the duty runway as declared by the tower, he had to be told three times before he put his gear and flaps down and was led to the 180 by his flight leader.

The tower controlman noted that he was flying quite erratically and did not acknowledge transmissions. However, the landing was successful, despite his using the main tank which was supposed to have already been exhausted. He turned off the runway, cut the engine and climbed out of the cockpit without help although with difficulty.

A flight surgeon who saw the aviator almost immediately after he landed noted he was acutely ill. He was pale and sweaty, shaky, somewhat disoriented and uncoordinated and slurred of speech.

In addition, he complained of severe headache and nausea. Blood was taken for laboratory tests for carbon monoxide and salt. For the treatment of possible CO intoxication and to counteract the possibility of the pilot's going into shock, he was given 100 percent oxygen by mask.

A second flight surgeon who saw him about 15 minutes later noted that his appearance at that time had become almost normal.

After a bottle of coke, two salt tablets with water and 20 minutes' rest, the pilot reported only a mild weakness.

Several hours later another pilot took the plane up for a 20-minute hop to run a cockpit CO determination with the MSA Co. CO colorimetric bulb indicator, Mark II. Results showed 0.0% CO.

Investigation showed that the chase pilot was in good physical condition on the morning of his flight. He had had a quiet weekend, nine hours' sleep Sunday night and a good breakfast Monday morning. He does not smoke and his oxygen equipment was in good condition and clean.

The blood tests showed no evidence of abnormal presence of carbon monoxide but did show a salt loss.

With the possibility of carbon monoxide intoxication ruled out, what was the cause of the pilot's difficulties?

The first half of the outbound trip was over the Atlantic where temperatures ranged in the high 80's with relative humidity above 50 percent. The pilot reported that the cockpit was hot and uncomfortable and the outside air vent brought in only a blast of hot air. Although he "sweated a lot," he did not drink out of his canteen. He had taken no extra salt prior to his flight.

In view of the physical findings, the pilot's story and the laboratory tests, the flight surgeon concluded that the pilot suffered from heat exhaustion and possibly a mild heat stroke.

Summer's high temperatures and humidity bring a host of problems for the pilot.

If you are not in good physical condition, you are more susceptible to heat exhaustion and heat stroke. A tired, overweight flier up late partying the night before is a sitting duck for heat exhaustion on a low-level flight on a hot, humid day. And once you've had one attack of heat prostration, you are more susceptible to a second. The medical explanation of this is that severe prickly heat decreases your ability to perspire in the afflicted skin areas for an indefinite period of time.

Heat exhaustion occurs when your body's heat dissipating mechanisms (in the summer chiefly evaporation of sweat and vaporization of water through the nose and mouth) become overactive. Heat stroke results when your body's heat dissipating mechanisms are overwhelmed.

While lower altitude flying pre-

Continued from preceding page

sents the most serious continuous problems, when you take the cockpit of the jet parked in the sun and add one properly dressed aviator, you have temporarily a very hot combination, in the sweaty sense. Jet refrigeration systems are hard put to meet low altitude requirements to say nothing of the period prior to takeoff, often fraught with delays, before the canopy can be closed and the system becomes effective.

How can you recognize an attack of heat exhaustion or heat stroke in the early stages?

The warning symptoms of heat exhaustion are a general feeling of illness, headache, dizziness, weakness, poor vision and nausea or vomiting. You can have muscular cramps also. In extreme heat exhaustion, the victim goes into shock with pallor and cold clammy skin.

Warnings of impending heat stroke begin with lessening and even absence of sweating. Other symptoms are weakness, headache, giddiness or dizziness, stumbling, loss of appetite, and nausea or vomiting. Onset of heat stroke is sudden with the skin becoming flushed, hot and dry. The victim experiences fatigue, shortness of breath, faintness and even collapse. Extreme symptoms are delirium, unconsciousness and convulsions.

By now you are probably thinking, What can I do to beat this deal?

Get plenty of rest and stay in good physical condition. Then make sure you drink plenty of liquids and sprinkle your food liberally with salt or take salt tablets.

Extra liquids and extra salt are vital in the hot summer months to replace water and salt lost in sweat. Under conditions of heavy sweating, intake of liquids should be a pint or more an hour. And it's better to drink your liquids in small quantities every 20 to 30 minutes than to gulp down hourly pints.

Your ordinary diet provides you with some 10 to 15 grams or two to three level teaspoons of salt a day. If you are working in a hot environment, you should increase your salt intake by some 5 to 10 grams or one to two teaspoons. Seven to 15 of the 10-grain salt tablets equal the recommended increased daily intake of 5 to 10 grams.

In the past there have been instances of nausea as a result of taking the older ("white") type of salt tablets. However, the impregnated, red coated salt tablet presently available in the Navy has tended to minimize this aspect.

For those of you who haven't utilized these salt tablets in the past, it is suggested that you give them a try on the ground some day.

► In his report on the case of the ill chase pilot, the flight surgeon had some additional recommendations which we'll pass along:

► Prepare yourself for an extended flight in hot weather by adding extra salt to your food and drink for at least one day before the scheduled flight.

► Take some salt tablets with liquid just before your flight and carry both salt tablets and liquid during the flight.

► Try painting your helmet white for summer. Dark colors absorb heat.

► Put a wet quilted cloth cover on your canteen so that heat loss through evaporation will keep the fluid from becoming tepid.

► Carry along a small thermos jug of salted juice or tea but secure it in the cockpit so as not to reduce the combat effectiveness of your planes cockpit. Try refrigerating your thermos overnight and filling it just before your hop.

► Schedule hops in the cool morning hours, preferably at dawn, so that you will be through before the heat of the day. (And, if possible, start your flight with a half-hour at 7000 or 8000 feet to cool your plane off.)

► Know that heat exhaustion may occur. If you experience the symptoms, take some salt tablets with liquid.

► If you become ill, abort the mission. Climb to cooler altitudes or land at the first opportunity.

". . . belt, oxygen, vi-i-i-s-s-s-o-O-O-O-r-r . . ."

NOTES FROM YOUR flight surgeon

Gloves

ARE all the pilots in your outfit wearing gloves on all flights? They not only provide excellent fire protection, but, also, afford protection against "cold injuries." In a recent mid-air collision, one of the pilots, without gloves, ejected and opened his chute at approximately 30,000 feet. He tried to keep his hands warm by placing them between his legs, but this was not much help. The pilot stated that it took him 10 minutes for his hands to warm up enough to unbuckle his parachute harness. If he had landed in the water and had to get off the harness to keep from drowning, it might have been a different story. Wear those gloves! They may be awkward but so are airburned hands. This lad was lucky; you might not fare as well.

While we are on the subject of equipment, take a good look at the personal gear that you fly with (e.g. pencil, key cases, watch bands, etc. . . . .) In the same mid-air collision involving the pilot with no gloves, the other pilot wore a metal clamp-on type watch band. In the course of the ejection, the watch band cut a gash in his wrist requiring six stitches. In another mid-air collision, the pilot, of another service, ejected and received four badly bruised ribs when his parachute harness pulled tight across a mechanical pencil he wore in his breast pocket. This same pilot was stabbed in the leg by his own keys protruding from a leather keycase in the leg pocket of his flight suit. Here were three injuries sustained unnecessarily by ordinarily harmless equipment. All three could have been far more serious if ejection took place at a higher airspeed or a puncture occurred in a vital spot. Ejection is hazardous enough without adding to the dangers with your own personal gear. If it's not necessary, don't fly with it. Carry objects where they won't injure you if you eject. Wear a good leather or nylon watch band.—*MAG 2 "Hot Dope Sheet."*

Monthly Emergency Review?

ONE engine caught fire, prohibiting usual climb; tow caught on bridge; pilot ditched plane.

Thankful to survive, he said, "I feel that I must heartily endorse the training in survival techniques that I have received. My actions were relatively unthinking and automatic concerning survival after the crash. The survival training in the 'Dilbert Dunker,' the ejection seat, the F2H-3 NAMO-TRAINER, and water survival, that I received in the Naval Air Training Command and more especially the FAETUPAC Survival School at San Diego, all profoundly assisted me in surviving the crash. I would have found much greater difficulty getting out of the aircraft, ridding myself of the parachute, boarding the raft and igniting the flares had I not had the benefit of this training." He further suggests:

"At least one emergency procedures review period per month in the type aircraft NAMO-TRAINER."

Toggle Tangle

RECOMMEND: That pilots be informed again of the possible fatal results of improper positioning of mae west toggle cords.

In the case which led to this recommendation, the F3H pilot had tucked his mae west toggle cords under the CO_2 bottle cover flaps. After a chute water-landing, he had difficulty finding the toggle cords of the mae west. "I pulled the right side toggle cord with my chute still on. I realized my mistake and unfastened the chest strap as rapidly as possible with no difficulty. I took off the chute and unbuckled the pararaft lanyard from my mae west." By that time the helicopter was there and he was rescued without incident.

"I would suggest that all pilots keep the toggle cords on their mae west free and easy to grab. *Do not* place them under the flap."

June is the Sunniest

ALTHOUGH it isn't the hottest month, June is the month when the sun is highest in most of the States, and therefore is the month when you can expect the worst sunburn if you happen to be exposed. May is worse than August.

And what this all has to do with aviation is that sunburn lowers G-tolerance.

A mild sunburn, just redness of the skin such as most persons might experience from sunbathing on the beach or working in the yard, may cause a severe lowering of the threshhold for blackout.

This effect is temporary and disappears with the sunburn. It seems to be caused by a disturbance in surface circulation.

There have been some pilots worried by an "unexplainable" decrease in their G tolerance who were much reassured to find the simple and transitory cause.

And because a sudden, unexpected blackout can have fatal consequences, a good rule to follow is don't fly G with a hot sunburn if you hope to live for the tan!

a plug for plugs

Failed AC-18Y spark plug, above, with core damage of the type which can result from overtorquing, compared with undamaged spark plug below.

A CHAIN is only as strong as its weakest link and very often the spark plug, the last link in the ignition system chain, is found to be the weak link. No matter how well the points are adjusted, the magneto is timed or how excellent the condition of the harness, the plugs need the care and maintenance commensurate with their function if the chain is to hold.

Many accidents have occurred during carrier operations where, because the aircraft is lost at sea, the only information available was the pilot's statement, "engine began to run rough and lose power . . . backfired . . . DITCHED."

Two recent occurrences whose cause could be determined will illustrate the possible cause and effect of many undetermined "loss of power accidents."

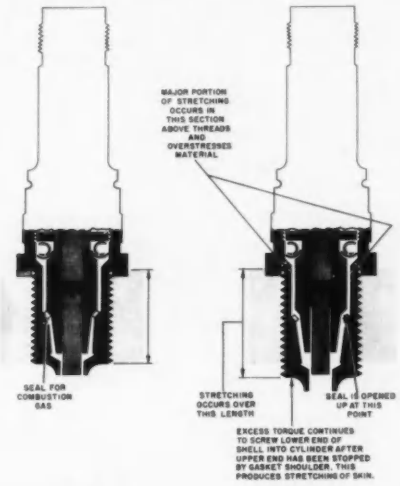
Case 1.

What: An R4D-8 experienced a rough running starboard engine, followed by fire out the lower port side of engine cowling. Engine was

feathered and flight diverted to NAS ---------- where a normal landing was made.

Why: Subsequent investigation revealed five loose plugs on the starboard engine. Aircraft had 28 hours since last check. Suspect improper torquing of plugs.

Recommendation: Re-emphasize to check and inspection crews of necessity for proper spark plug torque and inspection procedures.


MAJOR PORTION OF STRETCHING OCCURS IN THIS SECTION ABOVE THREADS AND OVERSTRESSES MATERIAL
SEAL FOR COMBUSTION GAS
STRETCHING OCCURS OVER THIS LENGTH
SEAL IS OPENED UP AT THIS POINT
EXCESS TORQUE CONTINUES TO SCREW LOWER END OF SHELL INTO CYLINDER AFTER UPPER END HAS BEEN STOPPED BY GASKET SHOULDER. THIS PRODUCES STRETCHING OF SKIN.

INSTALLATION WITH NORMAL TORQUE **INSTALLATION WITH EXCESS TORQUE**

Case 2.

What: During a local flight an HOK-1 experienced an extremely rough running engine and vibration accompanied by partial loss of power. Immediate forced landing was accomplished in an open field.

Why: Loss of rear number 6 spark plug from cylinder assembly. Spark plug improperly seated, possible maintenance error.

Recommendation: Maintenance crews be rechecked on proper installation of spark plugs.

The maximum operating reliability of an aircraft engine depends to a large degree upon the efficient performance of its spark plugs. Therefore, proper servicing and installation techniques are essential to efficient spark plug performance. To obtain the best operating performance of aircraft spark plugs—and the engines in which they're installed—all personnel concerned with maintenance of spark plugs should be thoroughly familiar with the contents of General Reciprocating Engine Bulletin No. 137.

Test yourself on these questions; they're all out of GREB 137 and they're all important to that piston-powered machine that's going flying soon after you install a new set of plugs.

1. After removal of an old spark plug, battered plug nose and bent electrodes is an indication of what?
2. What method is best for removing lint or foreign matter that has lodged in the firing chamber of a new plug?
3. What is the best method for keeping the cylinder clean while cleaning bushings or heli-coil inserts?
4. What is the best method for applying anti-seize compound to plug threads?
5. To what extent is the plug screwed in with the fingers before using the proper hex wrench?
6. What is the maximum tightening torque for 18 MM plugs?
7. What is the correct tap for cleaning heli-coil inserts?
8. Cracks or evidence of fracture at the root of top threads of the plug is a result of what?
9. Is it true that plug gaskets should be kept in continuous use as this will seat the plug better?
10. Cracked or fractured barrel insulators is a result of what?
11. Do you know the acceptable plugs for the engines that you use?
12. Why is it so important to bomb test all plugs before installation?
13. What is the proper gauge for checking the gap between the ground electrodes and the center electrode?
14. Why shouldn't you use carbon tetrachloride in cleaning the electrodes in the firing chamber of the plug.
15. When is the best time to install plugs, while the engine is hot or while the engine is cold?
16. What is the primary reason for proper torquing of spark plugs?
17. What part of the spark plug lead should not be touched prior to and during installation, and why not?

Check your answers against those on page 47.

Selected Forced Landings, Incidents, Ground Accidents, Notes and Comments on Aircraft Accidents

'. . . damage was aggravated by hysterical reaction of the plane captain . . .'

BREAKAWAY—With a rated plane captain at the controls during engine turnup, an SNB-5P jumped the wheel chocks, made a 270-degree turn to port, abruptly reversed direction, and spun approximately 270 degrees to starboard, at which time the tail assembly contacted the starboard propeller of an adjacent SNB-5P causing sudden engine stoppage. The aircraft was properly chocked and the tail tied down prior to turnup. Tailwheel was not locked.

The direct cause of the occurrence was breakage of the tailwheel tie-down line while the starboard engine was being checked at 1800 rpm with the port engine idling at 1000 rpm.

Parking brakes were checked immediately after the accident and were found to be operating satisfactorily. It is concluded that the parking brake handle was not seated properly when set and thus resulted in brake failure.

Damage was aggravated by the hysterical reaction of the plane captain when he discovered movement of the aircraft from the chocks. Obviously he attempted to maintain directional control by use of the throttles.

Corrective action: (a) Instructions for plane captains have been revised to require that all tie-downs, wing and tail, be utilized when turning up on the line. (b) Action has been initiated to procure cable tie-downs for the tail in lieu of rope now in use. (c) Systematic care taking has been initiated to keep parking spaces free of oil and grease in order to provide maximum friction between wheel and parking surfaces.

In addition to the corrective action taken, it is recommended that supervisory personnel insure that all non-pilot personnel authorized to turn up aircraft utilize the "before starting engines" portion of the pilot's checklist prior to turning up the aircraft. Such items as "parking brake set" are easily overlooked if an appropriate checklist is not used.

LEAD TIME—The plane captain of an R4D-8 was taxiing the aircraft to the parking area under the direction of a member of the line crew. The starboard wing was given an "all clear." Upon noting insufficient space existed to clear the wingtip the signal was changed but too late to avoid the aircraft's starboard wingtip from striking the parked crane.

The personnel detailed to the moving of the aircraft did not exercise due caution while operating the aircraft in a confined area. In addition, the crane was parked too close to the aircraft parking area. The ground handling equipment has been moved and training with emphasis on ground safety is being continued.

Stop signal came too late to avoid hitting the crane . . .

PROP BLAST—A simulated free deck launch of an S2F was being made in preparation for carrier qualification. The aircraft was parked 3rd in column 15 feet behind the second plane awaiting the turnup-and-launch signal from the LSO. Propeller blast from the lead plane, at full power turnup, showered the planes behind with pea gravel from the surface of the runway.

This gravel cracked the windshields and nicked the leading edge of all propeller blades requiring replacement of propellers and windshields on the aircraft.

It was recommended that in the future simulated carrier deck launches be made on runways free of gravel or other loose foreign objects.

LADDER FATALITY—An airplane cleaner, returning to his duties after a coffee break, mounted a cockpit hatch ladder and, when approximately halfway up, he and the ladder fell backwards. The man struck his head on the ramp concrete and subsequently died. The cockpit ladder used was an ordinary straight ladder equipped with safety shoes at the ground level and with a piece of angle iron braced to form a triangle and mounted on the top side of the ladder in order to lie flat on the floor just inside the hatch. The disadvantage of this type of ladder is that the piece which rests upon the cockpit hatch floor is subject to damage and even if only slightly bent will have less than the normal seven-inch surface contact.

This might account for the apparent widespread use of A-frame ladders. These are most hazardous since there are no handrails and most of the lad-

FROM THE GROUND UP

Continued from preceding page

ders come up to about 3½ feet from the hatch floor. Entry is not too difficult, but *it is hazardous to leave the aircraft and let down "blind" onto the ladder.*

Self-supporting stands should be used, light enough to be stored on their sides and provided with hand-rails and stability needed by airplane cleaners and others who enter the aircraft while carrying equipment or material. The use of other than proper and prescribed devices for mounting cockpit hatches should be prohibited.—*USAIG Bulletin*

C-NUT LOOSE—After several attempts to lower his landing gear by all possible methods, a pilot of an SNB made a one wheel landing at NAS Atsugi.

Investigation revealed the C-nut and adjusting check-nut chain. The landing gear chain jammed in the lower landing gear sprocket prohibiting rotation of the torque tube. The aircraft received major damage. There were no personnel injuries. —*Atsugi Consolidated.*

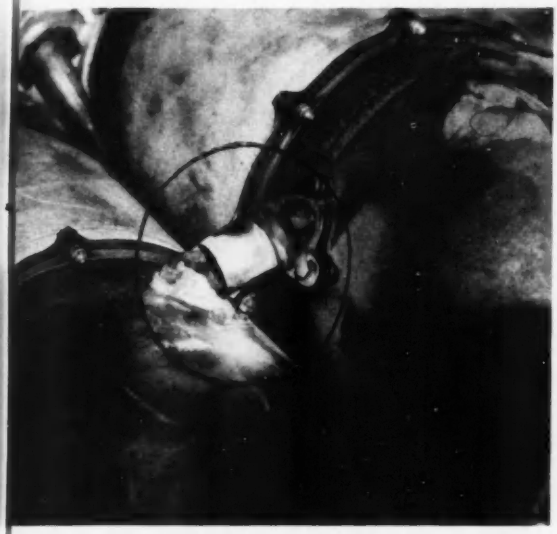
POSITIONING OF APU—When using an APU unit such as the NC-5 to start engines it is recommended that it be positioned directly in front of the nosewheel. This will tend to prevent the aircraft from striking the APU unit with the props in the event of brake failure or premature removal of chocks.—*VR-24*

TOWBAR CHECKOUT—An airline which recently took delivery of a new type of aircraft had two accidents caused by towbars being disconnectd from aircraft and falling on the feet of the employees. These two cases resulted in broken toes.

The suggested remedy was that more care should be exercised and that the employees should be given some training in connecting and disconnecting towbars to the aircraft. It was also suggested that safety shoes should be worn in the hangar area.

It would appear advisable for airlines to put their employees through a few dry-run practices connecting and disconnecting towbars to new types of aircraft in order to familiarize personnel in the proper way of handling towbars on these aircraft. —*USAIG Bulletin*

Portable quick-engine-change unit electric test panel demonstrated by its designer, N. E. Royce, AE1 of VR–8; tests cowl flaps; oil cooler door actuator; CHT bulbs and heads; prop governor control and brush block leads; automatic feathering switch to insure its opening at specified BMEP reading; BMEP transmitter; manifold pressure transmitter; oil pressure transmitter and low pressure warning switch; fuel pressure transmitter and low pressure warning switch; supercharger bearing drive shaft temperature gage; cowl flap and oil cooler door actuator transmitter; and zone one and two of the fire warning system.



. . . a 3-inch hole was the first indication of an interconnector burn-thru.

INTERCONNECTOR BURN-THRU — On his first familiarization flight in an F9F-8B, the pilot completed his slow airwork and informed his chase pilot that he was ready to land. The chase pilot rendezvoused and took up a parade position on his right wing. Approaching the break for landing, the chase pilot noticed a scorched hole, three inches in diameter below the aft right blow-in door on the other aircraft. He instructed the pilot to land and shut down.

The pilot stated that the engine operated normally throughout the flight. He had no indications of the tube weldment failure.

The reporting unit noted that though this component is inspected every 60-hour check, this incident points up the need for meticulous inspection for signs of failure.

COCKPIT CLUTTER—The horizontal stabilizer of an A4D-2 was actuated to full nose-up trim upon application of full forward throttle during takeoff. Cannon plugs normally attached to T-208 box or ARN-14 control box in the left console were found to be adrift and caught between the throttle handle lever and the support of the horizontal stabilizer manual over-ride switch.

Application of the throttle bent the shaft causing the over-ride switch to actuate to full nose-up trim. The bent shaft prevented the switch from being actuated to nose-down trim. At the time, a block-off panel was installed in lieu of T-208 or ARN-14 control box.

Recommendations: Take action to insure that cannon plugs are properly secured in their respective cavities.

BUOY DAMAGES HULL—After making a normal landing the P5M-2 proceeded to make the Mars buoy. The first attempt to make a buoy was unsuccessful and a second attempt was made. This was successful. The plane captain noticed at this time that the aircraft was taking on water through a hole in the electronic compartment.

Proper emergency procedures were used to get the aircraft to a safe position. While the exact cause of the damage was not determined it is felt that the buoy could have caused the following damage! Two holes made in the port side near the chine and rivets were scraped off at several places along the side.

HANDLING OF JP-4 FUEL—JP-4 is a blend of several petroleum fractions. It generally also contains one or more additives to improve specific properties. There are no limitations to its exact composition so long as the finished material complies with the requirements for JP-4, as defined in Military Specifications MIL-F-5624. This specification was intentionally made very broad so that practically any refinery, working with almost any crude oil, could successfully prepare this blend with a minimum amount of specialized equipment.

The object of this was to make JP-4 available on a world-wide basis with minimum interference to civilian business. Furthermore, in the event of a major war, the supply of JP-4 could be increased tremendously almost overnight, by simply diverting materials that normally would go into the preparation of motor gasoline. These materials would be available as a result of gasoline rationing, since the large volume of such fuel used for pleasure driving is considered to be our greatest immediate reserve supply of fuel.

JP-4 is better than gasoline for turbojet operations for several reasons; first, it is cheaper because it doesn't have an octane number requirement; second, it contains no tetraethyllead, which forms solid deposits in the engine when it is burned; and third, it is less volatile. This means that less JP-4 would be lost from aircraft tank vents by evaporation when flying at high altitudes.

JP-4 should be handled with the same precau-

Continued from preceding page

tions as any other inflammable material. Occasionally, stories are written which imply that JP-4 is not as dangerous as gasoline, and high octane gasoline is called "hotter" than other fuels. This is completely erroneous. All gasolines are essentially equally "hot" insofar as they yield essentially the same amount of heat per pound when burned. And JP-4 has about 99 percent of the heat content of gasoline.

The flash point of a fuel is the minimum temperature at which a flash of fire sweeps across its surface, which is in contact with the air, when a small flame is applied. This test is performed in a standard piece of apparatus under carefully controlled conditions. The flash point of JP-4 is low, but it also varies widely between batches because of the broad limits of the specification. It may be anywhere from —20° F to +50° F. There is no flash point requirement in the specification because of the difficulty of running the test in this temperature range.

The spontaneous ignition temperature of a fuel is the minimum temperature of a heated surface when it ignites a small sample of fuel dropped upon it. No flame or spark is required to start this fire, although, of course, air must be present. The results vary widely depending upon the design of the test apparatus, the size of the sample, and the time lag between introduction and ignition of the sample. For illustrative purposes, two examples may be considered. JP-4 has a minimum spontaneous ignition temperature of 468° F, with a three minute time lag, while grade 100/130 aviation gasoline has a minimum spontaneous ignition temperature of 824° F, with a three-second time lag.

JP-4 cannot be distinguished from other grades of jet fuel by color, odor or other simple means. Even specific gravity determinants are not suitable for this purpose, because each grade has a broad range of gravity which overlaps the range of another grade. Laboratory analysis is required to determine the classification and properties of jet fuels.

Actual contact with all liquid fuels, whether JP type, gasoline, aircraft, or automotive, should be avoided as much as possible. The dangers of fire are obvious, and in addition there is a health hazard.

Prolonged breathing of the vapors of the above fuels could cause anesthesia or suffocation. Even less exposure could cause damage to the respiratory system, because fuels and their vapors tend to extract fats from body tissues. Contact with the skin can be harmful for the same reason. When fats are extracted from the skin, it cracks and invites infection.

Occasionally, individuals have been known to develop a rash after handling gasoline, jet fuel, or both. This is generally attributed to an allergy to certain trace materials present in these fuels. It may be best to transfer such individuals to other work, since it is usually impractical to investigate the exact cause or develop an immunity. Most persons are not adversely affected by moderate exposure to fuels.

Most shoes are made of leather, which is processed animal skin. It is affected by fuel similarly to human skin. Repeated exposure to fuel extracts the oil from the leather and causes it to crack. Sole leather is definitely weakened, and will wear out at an excessive rate.

Natural rubber is seriously degraded by fuels, however, many synthetic rubbers are quite resistant. The change in properties of these synthetics is a function of their composition as well as the composition of the fuel in contact with them. The fuels extract plasticizers from the synthetics, and on subsequent drying the synthetics are found to have shrunk.

JP fuels should be washed from the body as quickly as possible. For this purpose, as well as for removing it from clothing or similar items, a mild household detergent should be used. Large spills should be flushed away with plenty of water. Small ones should be wiped up, and the wipers stored in fireproof containers until final disposition can be made. A fire involving JP-4 fuel should be handled like any other fuel fire. CO_2 extinguishers are very effective on small fires, and foam or fog should be used on larger ones.—*GE "Jet Service News."*

HANDLING JET OILS—Synthetic base oils, MIL-L-7808, require meticulous handling not generally associated with aircraft engine lubricants. This type of oil may deteriorate in storage after 15 months to an extent whereby it may become unsatisfactory for use. The deterioration usually becomes apparent with oil failing to pass the lead corrosion test, or the formation of solids.

MIL-L-7808 oil should be issued within 15 months after the filling date shown on the container.

Contamination—Servicing procedures can induce contamination from open can lids, openers and delivery equipment. Delivery without filterization could prove detrimental to the engine.

Oil should be obtained in 1-gallon and quart con-

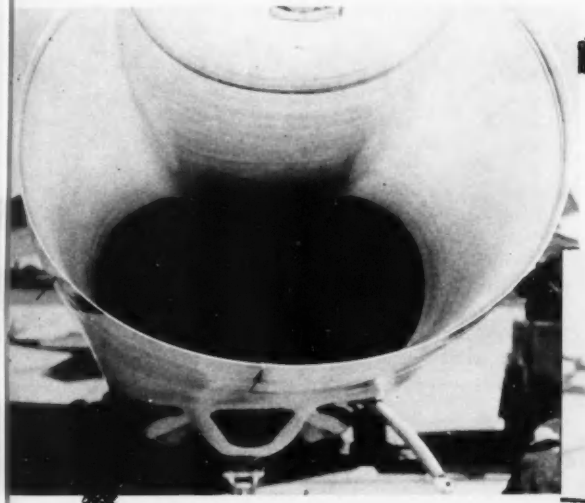
tainers only. The entire contents of the container should be used immediately or emptied into a filtering unit. Filtering units should be capable of filtering particles of 10 microns or smaller, and have provisions for keeping the unit closed when not in use. Its interior should be treated to handle MIL-L-7808 oil, that is, the surface will not peel when in contact with this type oil.

When using filtering units to replenish oil supply, the unit should be cleaned and flushed at least once each 30 days and the filter element replaced.

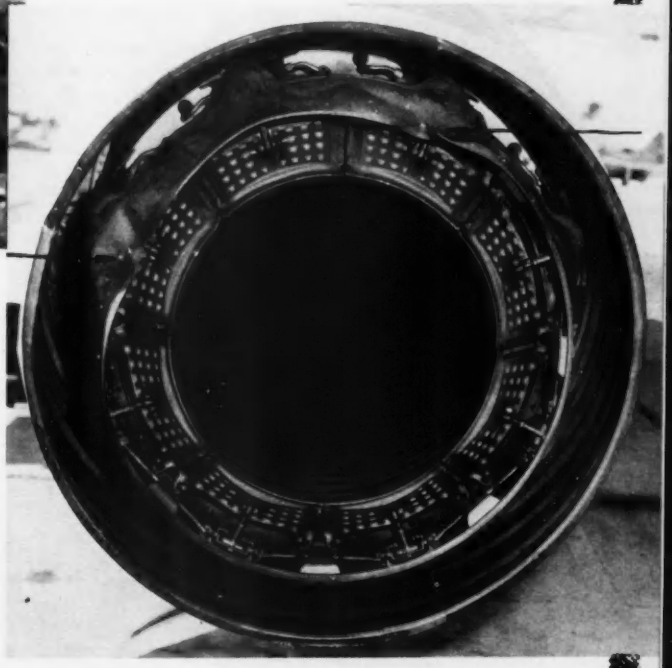
Before replenishing the oil supply from a container, the container contents shall be inspected for cleanliness.

Make sure replenishing equipment (i.e., container opener, funnel, etc.) is clean prior to use.

STARTER GENERATORS GE-2CM88 — FJ-3 aircraft are being returned to overhaul minus mounting clamp, GE-291C980-1, FSN R4730-203-6142-NGEC and Flange, GE-9411548PTI, FSN R2925-315-7396-NGEC. Since starter generators are stocked complete with mountings, it is necessary that the above parts be returned to overhaul activities with starter generators.—*Logistic Support Information Bulletin of 3 Jan 58*



Two F8Us were damaged when one, left unsecured, rolled back into another . . . . arrows show damage to afterburner, below, and intake, left.



SECURE FIRST—In his haste to direct the next incoming aircraft, an aircraft director neglected to chock an F8U immediately after directing it into the refueling pit. He signaled the pilot to hold brakes and secure the engine, then ran aft to direct another F8U into the pit. The first pilot unstrapped, then attempted to spot the director. Failing to see him, he released the brakes and propped himself up for a better view. While looking aft he realized the aircraft was moving and hit the brakes too late to avoid collision with the other F8U.

Supervisory line operations personnel should insure that sufficient directors are always available to provide service for operating aircraft.

Continued from preceding page

TOWING F9F-8T—During towing of an F9F-8T with standard bar and Clark tractor, its nosewheel collapsed immediately after rolling slowly over a small rise. The aircraft came to rest with the nose gear on the tow bar and on the nose gear doors. The refueling boom struck the driver of the Clark tractor on the left side and then struck the Clark tractor.

Investigation of the effectiveness of the ground safety lock showed it to be unsatisfactory due to the fact that it does not prevent the nose gear strut from becoming unlocked by the "pressure kicking method." (see photo B). The ground safety lock will restrict the rearward travel of the strut to approximately one foot.

It was recommended:

(a) that all F9F-8T aircraft be inspected for proper tolerances of the recessed roller pocket and roller and adjustment of component parts of the nose gear mechanical down lock assembly.

(b) that the ground safetylock (Part No. R-82-GR-GT-554) be redesigned so as to assure a positive mechanical lock of the nose gear assembly. (GT 658 now replaces GT 554).

(c) that no aircraft be towed with equipment that places towing personnel under the aircraft during towing operations. The use of the Tractor 4-wheel-drive, aircraft type MB-1 and universal tow bar assures safe clearance between the towing personnel and towed aircraft.

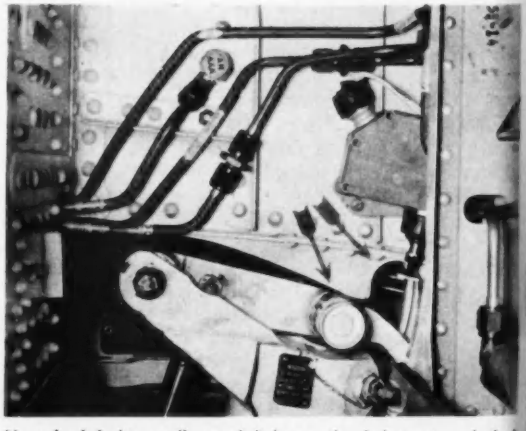
(d) that no F9F-8T aircraft be towed without a ground safety lock installed. If a GT-554 ground lock is being used, emergency hydraulic DOWN pressure should be ON with other hydraulic circuits OFF while towing.

SHORT STORY—

Malfunction Report: J-57-P4A
Type Operation: Ground run
Symptom: One bareheaded sailor
Cause: White hat sucked into air duct
Field remedy and recommendations: Replace hat: Replace engine

. . . relationship of in-flight refueling boom to tractor driver position—nose door and nosewheel fork is binding on the tow bar.

SIMULATE FORCES ENCOUNTERED IN TOWING:—With the nosewheel just clear of the deck the mechanic on the far side applies steady force to the strut. The other mechanic is in a position to apply sharp blow to the nosewheel. The nose strut can be collapsed in this manner.



Nosewheel locking roller and linkage—the linkage is unlocked and in a position to continue retracting cycle.

er posi-
ow bar.

e nose-
applies
tion to
lapsed

ocked

MURPHY'S LAW★

REVERSED CANNON PLUGS PICKLES RACK—The pilot of an A4D-2 on a high altitude bombing hop set his ordnance switches and began his first dive. As he "pickled off" at release altitude, he felt a severe jolt from his starboard rack, and was notified that he had dropped a bomb rack instead of a bomb. He checked his switches and found them to be properly set.

Ordnance personnel had *reversed* two bomb rack cannon plugs; one plug completing the bomb release circuit and the other completing the ejector circuit. When the pilot pressed the bomb release button, *the rack was ejected rather than a bomb being dropped.*

Due to the fact that the two cannon plugs are similar, creating the possibility of reversing the connections, the squadron involved has painted the ejector cannon plug and receptacle red on all aircraft and bomb racks.

REVERSED RE-SET FUSE—An F9F-6 landing gear collapsed during landing roll-out. Investigation revealed that the landing gear auto-reset fuse was installed in *reverse.* Continued and increased vigilance in complying with procedures outlined in the HMI Manual and other technical publications was recommended.

WIRED BACKWARDS — Immediately after takeoff in a P2V-5 the fire detector lights indicated a fire in the port engine. The starboard engine began to vibrate and an immediate landing was made with no further damage to the aircraft.

Investigation revealed fire in the starboard engine. The fire detector system was wired incorrectly

Wire W6A20 was connected to the right side (fire detector test SW). Wire W5A20 connected to left side Fire detector (SW). Wire W3A20 Connected to left control unit. Above hookup test (SQ) and test lamp correspond but to incorrect engine.

A Safety AmpFUR recommended that P2V units check for proper wiring and testing of the circuit for correct indication.

★ If an aircraft part can be installed incorrectly, someone will install it that way!

SPARK PLUGS—ANSWERS

1. Loose foreign material within cylinder. Possible internal failure.
2. Compressed air.
3. Steady flow of compressed air into other plug port of cylinder.
4. With a small brush—making sure not to get compound on bottom two threads nor on the electrodes.
5. A plug with good, clean threads, free from foreign matter will cushion against the gasket before use of a wrench is necessary.
6. 30 lb/ft maximum—25 lb/ft minimum.
7. *Don't use a tap!*—use a wire brush.
8. Previous over-torque of plug.
9. Most gaskets, especially after prolonged use, will not provide a gas-tight seal. GREB 137 says to use new or overhauled gaskets.
10. a. Improper installation ignition harness lead.
    b. Over-torque plug lead gland nut.
    c. Design deficiency (especially after plugs have been overhauled).
11. Refer to latest amendment of GREB 136.
12. To see if they will operate properly under the pressure present within cylinders.
13. *Round* stock gauge of the go/no-go type.
14. Carbon tetrachloride has grounding qualities causing fouled plugs, and doesn't completely evaporate under pressure and heat.
15. The best time to install plugs is while the engine is cold. Plugs have tendency to seize in the the bushings if installed while engine is hot.
16. The spark plug gasket is a seal for a gas tight cylinder. Over torquing the plug causes damage to the gasket, damage to the plug itself and damage to the plug threads and bushings. Under-torquing can cause gas leakage and further loosening of the plug.
17. Neither the connector nor the spring should be touched with the fingers. Body salt can start corrosion and cause possible shorting of the plug.

TIP TANK

MISCELLANEOUS AVIATION SAFETY TIPS . . .

Air-Sea Rescue—Spotting—

RECENTLY an air-sea rescue exercise proved a point for sun glasses. Sent out to spot a one-man life raft trailing dye-marker, an observer in an air-sea rescue plane reported the dye-marker was clearly seen with the naked eye for 270 degrees of the orbit. Over the remaining 90 degrees it was not apparent enough to attract the attention of an observer who was not aware of the raft's exact position. For about 30 degrees on each side of a line directly into the sun, the dye-marker was invisible to the naked eye. However, at *any point* in the orbit the dye-marker could be seen clearly by an observer wearing polaroid sun glasses.—*FSF Accident Prevention Bulletin.*

Professional Approach

"MOST of us need more than we've got if we are to stand out from the pack. Without specialized, technical knowledge we reach a certain level, and after that it takes something extra. For me it was study."—*Chief Engineer, Gen. Mtrs. Air Tran. Sec., in FSF "Aviation Mech's Bulletin"*

Dry Run

WE ARE always talking about properly planning your X-C flight. Have you ever considered "flying the hop" prior to the day of actual launch. The Training Aids Unit of MT&RG-20 have five jet basic trainers that will give you an excellent simulated flight. You not only get the enroute work, but can get a climbout and a "practice" penetration at the destination. This can be the same penetration you will actually use.

Takeoff Yarn

REPRINTS of Beirne Lay, Jr.'s gripping story entitled "The Jet that Crashed Before Takeoff," originally appearing in *Harper's* and subsequently in the *Reader's Digest,* were distributed to squadrons via the May 15 Crossfeed.

Approach Control Contact

IN ANSWER to a question of "Why do pilots have to contact Approach Control if weather is CAVU and the flight is operating VFR? E.R. Watson (EAL) reports the following answer from the CAA:

"At the busier terminals during VFR operations, the Approach Control position in the tower does not handle much traffic due to flights cancelling IFR 30 or more miles out, and other flights operating VFR. By contacting this relatively inactive position, general airport information such as altimeter setting, wind direction and velocity, runway in use, can be given. When switching over to the local traffic controller this information has already been received, freeing this frequency from such details, thereby permitting its use for only essential spacing and landing clearance information."

Stalls-Spins

STALLS and spins continue to be amongst the worst killers of pilots and aircraft. Airspeed and altitude control during IFR conditions and clear thinking in the landing or FCLP pattern will save you and your aircraft. Remember, if you are *thinking about a stall* while in the pattern you probably will never spin in. Don't get preoccupied.—*"VA-63 Flysheet"*

Reflectorized Tape

BUAER Notice 11320 of August 1957 lists stock numbers for reflectorized adhesive tape which is intended for use as a color code on four types of fire extinguishers used on the flight line:

Carbon Dioxide	Yellow
Dry Chemical	Green
Trimethoxyboroxine	Orange
Foam	Silver/White

The use of a standard color code will promote greater safety and lessen the change of error. All units should install this reflectorized tape on the extinguishers on the flight line.

Camera Gets Evidence

THE National Safety Council hands out a tip on a method by which your word will never be disputed when you come across faulty equipment, a bad place in a runway, or other hazards to safe operations. Get your camera and make a picture of it. This evidence is exact as to facts, has a memory that cannot be disputed, and is always on your side. Show a few pictures of your hot spots to the proper authorities and you will get action.

OLD PRO

LCDR Ernest M. CADENAS, VF-82

Aircraft: F3H-2N

During catapult launch the throttle was forced back out of LCDR Cadenas' hand to the idle cutoff position. With both hands he was able to force the throttle to the afterburner detent and the burner ignited normally. Confronted with an unknown emergency and unable to maintain altitude with full military power, LCDR Cadenas used intermittent afterburner. He declared an emergency, dumped his wing fuel, and landed back aboard without further incident. Cause of the incident was improper securing of the forward engine mount, which permitted the engine to shift aft several inches during catapult acceleration. *(For details see F3H "Cross-feed" of 3 March '58 and IPB, NavAer 01-245 FCB-504, Fig. 225.—Ed.)* LCDR Cardenas' action in the emergency situation was the subject of a commendatory letter from Commander, Carrier Division Four.

CDR K. H. BERKLEY, VAP 62

Aircraft: AJ-2P

When CDR BERKLEY's AJ nosewheel failed to lock down he declared an emergency and requested the chain arresting gear, meanwhile his fuel was burned down to 1000 lbs. The plane captain was instructed to turn the selector on the emergency hydraulic panel to the down position thus supplying 3500 lbs. of emergency hydraulic pressure to hold the nosewheel in the down position. The runway arresting gear was engaged shortly after touchdown. The nosewheel was held off during deceleration until the aircraft was almost stopped, then lowered gently to the runway. Brakes were never used. When the plane stopped, the locking pin was placed into the locked position by the ground crew.

There have been many instances of AJ nosewheels failing to lock down in the past. It is believed this is the first instance of an AJ being landed in this condition without the nose gear collapsing on touchdown or landing rollout.

Recognition of heads-up flying is essential to a positive program of flight safety. For this reason *Approach* will acknowledge certain selected individuals whose exhibited flying ability merits membership in the "Old Pro Club" of naval aviators. Commanding Officers are invited to submit nominations for selection.

". . . In Rangoon the heat of noon is just what the natives shun,

In Bangkok at twelve o'clock they foam at the mouth and run,

In Pengal to move at all is seldom if ever done—

But mad dogs and Englishmen go out in the mid-day sun . . ."

So said gifted Noel Coward in viewing the plight of those who must face the summer heat, and the delight of those who are free to choose their air-conditioned retreat.

Modern operational readiness doesn't permit retreat from the mid-day sun, for man nor for his machine.

Much (but not enough) has been done to relieve man of the discomfort of summer heat. But, like the mad dogs and the Englishmen, he and his machine must still expose themselves to the effects of hot sun on a hot, high, and not-quite-very-long runway. His machine won't complain, it will do its best. But . . . when summer's heat demands a longer takeoff roll because of decreased lift, his machine responds by putting forth less thrust. And in the cool, air-conditioned cockpit, man begins to sweat . . . the markers roll by . . . and he thinks of a song about mad dogs and Englishmen . . .

see HOT AS A PISTOL, page 10